



FRIDAY, MAY 17, 1878.

## Contributions.

## The Running Gear of Cars.

The publication of the following letter has been delayed for the purpose of making the necessary experiments either to confirm or refute the statements and conclusions of "A. M. W." As we have not been able to make them, we publish the letter without. Our correspondent, however, is evidently right about the fact that a force exerted against the side of a model or truck mounted on wheels and which acts to slide it laterally has less effect on it than a similar force exerted against a solid block like that shown in fig. 1. The first rolls in one direction and has a resistance of about 1 lb. to 320 lbs. of its weight. In the other direction the resistance to sliding is about 1 lb. to 5 lbs. of weight. The solid block has a resistance to sliding of 1 to 5 in all directions. That a lateral force less than sufficient to slide a model has no influence on it we are not prepared to admit, at least without confirmatory experiments or knowing more exactly the nature of "A. M. W.'s" investigation and the accuracy of the workmanship of his models.—EDITOR RAILROAD GAZETTE.]

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your current issue (April 5) that you still defend, by plausible arguments, your strange theory that there is no sensible flange pressure (only 0.06 lb.) in passing around sharp curves, which I controverted in the same issue by asserting it to be from 1,500 to 2,500 lbs. Assuming that your only object is to get at the truth and that you will, in no case, attempt to defend false theories, I proceed to point out wherein I judge you to have fallen for a second time into error on this important topic.

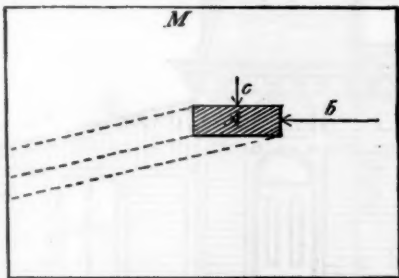


Fig. 1.

You give the following diagram (fig. 1), in which *A* is an iron weight, apparently intended to represent a truck, *b* is the longitudinal force acting upon it, and *c* the lateral force which represents flange pressure. You assume *A* to weigh 20 lbs., and the force, *b*, necessary to slide it on the surface *M*, you assume to be 5 lbs., corresponding to your assumed coefficient of friction of .25. You then say that "according to the reasoning of 'A. M. W.', in order to slide the weight *A* in the direction of the dotted lines, which is a resultant of the two forces [diagonal motion], must be produced 'by a force [*c*] adequate to slide' the weight on the board, or  $20 \times \frac{1}{4} = 5$  lbs."

This is undeniably true so far as this, there must be some force, somewhere, acting upon *A*, equal to 5 lbs., in order to slide it upon the surface *M* at all. In your assumed case, fig. 1, you take the force *b* as equal to 5 lbs., and then correctly deduce that any force, *c*, however small, will produce some lateral deviation from the path of *b*. But then proceed to make the false assumption that "a four-wheeled truck will act in a similar way." This is not at all the case. There is then no longitudinal force *b* equal to 5 lbs., or, in other words, there is no force acting sufficient to slide the truck longitudinally along the track with locked wheels. You will at once perceive the utter fallacy of beginning your argument by assuming such a force to exist which does not exist. To make a true parallel you should have drawn a diagram similar to fig. 2 herewith.

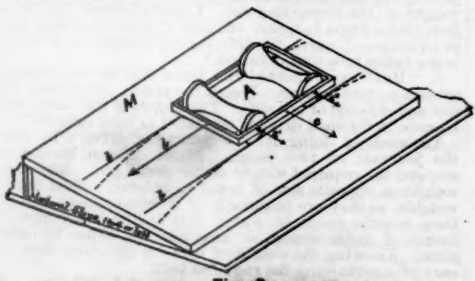


Fig. 2.

In fig. 2, *A* weighs 20 lbs. as before, and let the force, *b*, necessary to slide it longitudinally with locked wheels, or the force *c*, necessary to slide it laterally, equal 5 lbs. as before. Now, with unlocked wheels which can revolve freely, the force *b*, necessary to move *A*

longitudinally along *M* is practically zero, the main resistance being axle friction internal to *A*. The force, *c*, equal to 5 lbs., we will supply as you suggest by elevating *M* to an angle slightly less than 1 to 4 with the horizontal. Now, if you assert that, under these conditions (which represent those of practice), any force, *c*, less than 5 lbs., or any force, *c* or *c'*, less than  $2\frac{1}{2}$  lbs., will suffice to deflect *A* from the path *b* when it is rolled back and forth on it by the force *b*, you assert what is not true in practice as I know by tests with a precisely similar machine. If you do not believe this I can only suggest that you try the experiment for yourself.\*

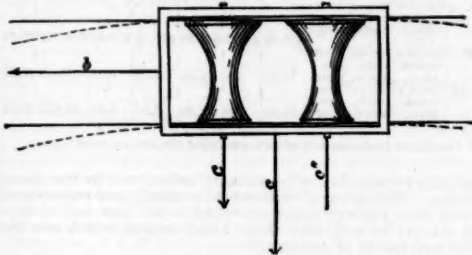


Fig. 3.

You go on to add:

"There is another way in which the fallacy of the reasoning of our correspondent can be shown. If the pressure of the flange against the rail is 2,500 lbs., as he suggests, it would require as much force to overcome the friction between the two as it would if there were a small brake block pressing against the flange with an equal force. With a coefficient of one-quarter, the friction with 2,500 lbs. on the flange would amount to 625 lbs., so that with the assumption of a weight of 20,000 lbs., or ten tons, on each truck, it would make the resistance due to this cause alone 62.5 lbs. per ton, whereas we know that on ordinary curves the total resistance is less than this."

The italicized sentence is, frankly speaking, wholly erroneous. It neglects the fact that this flange pressure is overcome by a powerful leverage. In fig. 4 let there be a flange

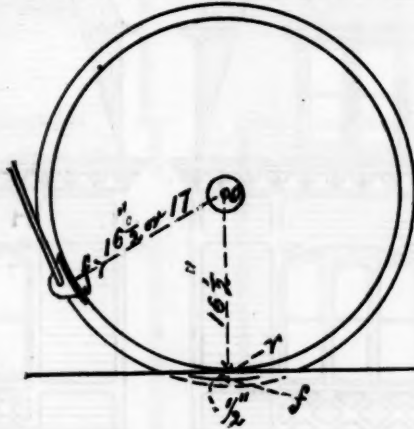


Fig. 4.

pressure of 625 lbs., as you compute, at the point *f*, distance  $\frac{1}{4}$  inch (it can hardly be in practice over  $\frac{1}{4}$  to  $\frac{1}{2}$  inch) below the rolling circumference of the wheel, or 17 inches from the centre. *O* is the point at which the power is applied, *r* is the fulcrum, the point of contact with the surface of the rail. The long arm of this lever is  $16\frac{1}{2}$  in., the short arm is  $\frac{1}{4}$  inch, and, consequently, the force at *O* necessary to overcome the resistance of 625 lbs. at *f* is  $625 \times \frac{1}{4} = 19$  lbs., scant, or only 1.9 lbs. per ton, instead of 62.5 lbs., as you compute. But even this is excessive, for three reasons. First, flange friction takes place on the front axle only. The rear wheels stand midway between the rails, at a point sufficient to



Fig. 5.

[*A* shows a point  $\frac{1}{4}$  inch below the top of the rail. To bring the centre of gravity (or rather centre of gyration) of the two rubbing surfaces, however, at a point distant one-half inch below the surface of the rail it would be necessary that the flange and rail should be in contact down to the extreme point of the flange.]

bring the rear axle radial to the curve. This alone reduces the computed resistance by one-half, or from 1.9 lbs. to 0.95 lb. per ton.\*

Secondly, the form of the flange and rail are such that the

\* In order to fully clear up the subject I will add that even if the machine *A* be constructed with wheels of very unequal diameter, as shown in fig. 3, so as greatly to exaggerate the assumed effect of coning car wheels, it will still tend to roll in a straight line in all cases when moved by the force *b*, and will require precisely the same stress to be applied at *c*, *c'* or *c''* to deflect it from a rectilinear path as if the wheels were cylindrical. This I have determined by practical experiment, and simply assert it to be a fact. Any one who chooses may attempt to explain it.

† This statement is based upon actual experiment with models specially constructed to test the principle. I do not, therefore, attempt to explain the fact, but simply assert it to be a fact. Any one who denies it, is advised first to try it. In no case do the rear flanges press against the rail in passing around a curve. The fact is not generally known, apparently, but has, nevertheless, often been observed in practice, as witness remarks of Mr. Reuben Wells, Master Mechanic Jeffersonville, Madison & Indianapolis Railroad, at last meeting of the Master Mechanics' Association.

point of contact between them is not, in most cases, situated  $\frac{1}{4}$  inch below the point of contact on the surface of rail, nor, in many instances, at any distance whatever. This will be evident from fig. 5. Assuming the lateral force (i. e., flange pressure) to be one-fourth of the load resting on the axle, as I assert, the wheel will be crowded up on the rail into the position shown by the dotted line, i. e., until a tangent to the surface of the rail at the point of contact is at an angle of 1 to 4 with the horizontal. In this there is actually no sliding of the flange along the side of the rail.

Nevertheless the flange pressure (i. e., the horizontal resultant) is one-fourth of the weight on the axle as before. In the course of time, however, the tread will be and is worn out, hollowing until the flange will come in contact with the side of the rail, and especially on the sharper curves where the curve of the rail helps to bring the flange in contact with its side, there will be produced the well-known "flange wear" on the inside of the outer rail. These considerations sufficiently explain why no greater proportion of wheels fail from flange wear, and also explain why a considerable percentage does fail from that cause. I again repeat that it should be evident to any practical railroad man that there must be some powerful side pressure to produce such abrasion as actually takes place (although you wisely pass over in silence that part of my argument), but the longitudinal force necessary to overcome this powerful side pressure is found by any just analysis to be very small. There is no analogy whatever between the effect of this flange pressure and that of a brake attached to the car and pressing against the flange or tread of the rail. In the latter case we have, instead of the unequal leverage before described, the equivalent of a bent lever with equal arms of  $16\frac{1}{2}$  in., as any one will perceive from fig. 4 who is sufficiently familiar with the principles of mechanics. To prove this to every reader, however, would require an elementary treatise on the subject. Thirdly, I doubt if the coefficient of sliding friction with ordinary car wheels is as high as 0.25. This you dispute, and you may or may not be right. It is a pure question of fact, for which however locomotive experience alone is insufficient, since it is well known that the coefficient of friction increases rapidly with the load per wheel. I only judge from some rude data as to the brake power necessary to slide car wheels. A. M. W.

## MASTER MECHANICS' ASSOCIATION.

## Report on Form and Materials for Locomotive Wheels and Axles and on Counterbalancing.

To the American Railway Master Mechanics' Association:

Your Committee appointed to report on "Best Form and Materials for Locomotive Wheels and Axles, also the Best Method of Counterbalancing," issued the following circular, as calculated to bring out the opinions, based upon experience, of the different members of the Association:

## CIRCULAR.

"The undersigned were appointed a Committee to investigate the subject of 'The best form and material for locomotive wheels and axles; also, the best methods of counterbalancing.'

"In order to obtain the necessary information from which to make this report, they would respectfully solicit replies to the following questions:

## "Section I.—Engine Trucks.

1. How many engines have you on your road equipped with cast-iron wheels in engine truck?
2. How many with cast wheel centres, and steel tires?
3. How many with cast wheels with steel faces?
4. What other kinds have you in use?
5. How do those compare with first cost and for cost of maintenance per mile run?
6. For this purpose, please state what description of wheels you recommend, and whether you prefer spotted, single or double plate wheels.

## "Section II.—Driving-Wheels.

1. What kind of wheel centres do you recommend for driving-wheels? Hollow spokes with hollow rim and nave or hub, or solid spokes with solid rim and hub, or solid spokes with hollow rim and hub.

## "Section III.—Tender Wheels.

1. How many engines have you that are equipped with cast-iron tender wheels?
2. How many with cast centres with steel tires?
3. How many with cast wheels with steel faces?
4. What other kinds have you in use?
5. Which gives the best result in miles run, including first cost and cost of maintenance?
6. For this purpose, what wheels would you recommend? Please state style preferred.

## "Section IV.—Truck Axles.

1. What are your standard sizes for journals for engine-truck axles on standard American engines, of 16 in. by 24 in. cylinders? Also give size of wheel-seats.
2. How many engines have steel and how many have iron axles in engine truck?
3. Which gives the best results, considering first cost, wear of journals and brasses, and cost of lubricants?
4. From your experience, what materials would you use, and what dimensions would you give for this purpose?

## "Section V.—Driving-Wheel Axles.

1. What are the dimensions of driving-wheel axles for American engines, 16 in. x 24 in. cylinders? Give size of journals, wheel-seat and centre of shaft.
2. How many engines have you with steel and how many with iron axles?
3. Which gives the best results, considering the first cost, wear of journals and brasses, and cost of lubricants?

## "Section VI.—Tender Axles.

1. Give the dimensions of your standard tender axles, including size of journal, length of axle, size of wheel-seat and diameter of axle in centre.
2. How many engines have iron axles, and how many steel axles in tender?
3. Which gives the best results, considering the first cost, wear of journals and brasses, and cost of lubricants?
4. Please state which, in your opinion, is the better material for tender axles—steel or iron? Also, the best dimensions for this purpose?

## "Section VII.—Valuable Suggestions, etc.

"Please give any information which may occur to you as



being valuable to the Committee in the preparation of their report. Also, please, if convenient, send tracing, on small scale, of standard axles for engines and tenders.

**Section VIII.—Counterbalancing.**

"Please state your method of ascertaining the necessary amount of counterbalance, and your manner of applying it." "Replies to the foregoing questions are solicited before March 1, 1878, and should be addressed to 'F. M. Wilder, Master Mechanic, Erie Railway, Buffalo, N. Y.'"

[Signed by members of Committee.]

To this circular replies have been received from ten members of the Association. Some have answered very fully, but in most cases they have passed by the questions of cost and economy, and have given their opinions on the questions of the best quality, without considering the questions of cost.

Of those giving replies to our circular on the subject of engine truck wheels, 9 had in use cast-iron chilled wheels, 3 had steel wheels, 4 had cast-iron centres, with steel tires shrunk on, and 6 had iron wheels with steel faces. Of these, four preferred chilled iron wheels; two of these four preferred what is known as the Washburn patent, and the other two those with spokes. Five preferred cast centres with steel tires shrunk on, and one preferred steel-faced wheels.

For driving-wheel centres two preferred solid hub with hollow spokes and rim; seven preferred hollow spokes, rim and hub, and one preferred solid spokes, rim and hub.

For tender-wheels, two preferred double-plate chilled iron wheels; five preferred Washburn patent chilled iron wheels, while three preferred iron centres with steel faces.

Your committee find it very difficult to obtain any data which give comparisons between the different classes of wheels, and are unable to make any recommendations as to the best, considering both the questions of durability and economy. They submit some tables showing difference in first cost and cost for maintenance as far as they can from the meagre data given. Mr. Rufus Hill, of the Camden & Atlantic Railroad, calls attention to the fact that leading wheels do not last as long as the trailing wheels, on either engine or tender trucks. We give some very interesting statements made by him.

These wheels were all chilled iron wheels, and as the table was made up from the failed wheels only, and does not in-

Secretary cause a recapitulation to be made, which will show the average mileage of all failed or worn-out wheels of each kind and size, and the cost per 1,000 miles run, and

No. of wheels.	Kind of wheels.	Present condition.	Time in service.	Value at present prices including cost of fitting up.	Interest for time in service.	Total cost including interest.	Present value.	Cost of service to date.	Average mileage made to date.	Average cost per 1,000 miles in etc.
16.	Engine truck steel tire.	33 per cent. worn.	age 4 years	\$35.10	\$9.83	\$44.93	\$29.95	\$17.98	136,757	13.14
486.	Engine truck iron.	100 per cent. worn.	age 1 year.	12.00	84	12.84	3.52	9.32	25,431	36.65
1,182	Tender truck iron.	100 per cent. worn.	age 1 year.	12.50	88	13.38	3.75	9.63	33,277	28.94

\* The \$17.98 includes cost of twice turning the tire on each wheel.

that this recapitulation be annually submitted to the Association. This system—without advertising any one's wares—will show railway managers which is the best and cheapest wheel; it will also show wheel-makers which are the principal causes of failures.

Record should be kept of the position of the wheels under the engine, numbering them—commencing at the front of the engine—as No. 1, leading wheels; No. 2, trailing wheels; No. 3, front tender-truck wheels; No. 4, front tender-truck wheels; No. 5, back tender-truck wheels, and No. 6, back tender-truck wheels.

Under "Cause of Removal" state the number of wheels removed for each cause.

One blank to be made out for each size of wheel.

In regard to driving wheels it seems almost the unanimous opinion of those who replied to our circular, that wheels with hollow rim, spokes and hub are preferable, only two favoring hollow rim and spokes with solid hub, and one solid rim,

The sizes of engine truck axles in use and those preferred as shown by the answers given to the different questions in our circular vary from  $4\frac{1}{4}$  in. diameter by  $6\frac{1}{2}$  in. up to  $4\frac{3}{4}$  in. by 10 in.

For driving axles those in use and recommended vary from  $6\frac{1}{2}$  in. diameter by  $6\frac{1}{2}$  in. long, to 7 in. diameter by 8 in. long.

For tender axles, those in use and recommended vary from  $3\frac{1}{4}$  in. diameter by  $5\frac{1}{4}$  in. long, to 4 in. diameter by 7 in. long.

Two master mechanics were using collarless journals, as both report, with good results over their ordinary practice; but the sizes of the journals differed very much, being only  $3\frac{1}{4}$  in. by 6 in. in the one case, and 4 in. by  $7\frac{1}{2}$  in. in the other.

From the reports received, and from their own experience, your Committee conclude that the error in most cases has been in getting journals too small, and think that a large-sized journal—both on account of its safety from breakage and it being less liable to heat from friction—is the best; and they would recommend the following sizes for the different journals for engines with 16 × 24 in. cylinders:

For engine truck axle.....  $4\frac{1}{4} \times 10$  in.  
" tender.....  $3\frac{1}{4} \times 7$  in.  
" driving axle journal.....  $7 \times 8$  in.

Tracings are submitted giving the axles recommended as standard axles.

For tender-axles your Committee recommend the Master Car-Builders' standard, as that axle does well, and, as it is desirable, especially when locomotive and car repairs come under the same head, and are done in the same shops, to have but one standard axle, axle-box and brass for cars and tenders. Your Committee would call attention to the use of a collarless journal for tenders, as well as for cars, and think that either independent stop-bars in the boxes, or caps on the end of the brasses, would be better than the present method of taking up the side or lateral play in the trucks, as the tendency of the present method of taking up the lateral play is to wear away the brass, thereby shortening it, and the lateral play is large and at times becomes excessive. This is especially the case on roads with many curves of short radius.

In regard to counterbalancing, but few suggestions were made on the subject, and your Committee will submit the



PRINCIPIO PASSENGER STATION, PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD.

S. T. Fuller, Chief Engineer.

clude wheels still in service, applied at the same time, it does not give the average life of that kind of wheel. It shows the fact, however, that the mileage of leading wheels is less than

ENGINE OR TENDER.	Leading or Trail.	No. of Pairs.	Size.	Average mileage.	Remarks.
Engine truck	Lead	8	28 in.	28,998	
"	Trail	8	28 "	43,024	
"	Lead	8	28 "	15,461	
"	Trail	8	28 "	27,008	
Tender	Lead	10	30 "	27,897	Front truck.
"	Trail	10	30 "	31,997	"
"	Lead	10	30 "	29,249	Back truck.
"	Trail	10	30 "	32,736	"
"	Lead	10	28 "	23,419	Front truck.
"	Trail	10	28 "	23,560	"
"	Lead	10	28 "	20,365	Back truck.
"	Trail	10	28 "	25,346	"

that of trailing wheels; and also that there is much greater economy in the use of large-sized wheels for these purposes, than in the use of small-sized wheels.

Your Committee submit a table showing mileage made by different engine and tender truck-wheels, giving the cost per 1,000 miles run; but as these wheels were in different kinds of service, and are of different sizes, the results shown are not a just comparison between the different kinds of wheels. The statement, however, is the best your committee can submit from the data given.

**Description of Wheels used in this Comparison.**

1. 16 wheels used in engine trucks of heavy passenger engines, having 28,000 lbs. on truck; size, 30 inches. Wheels with steel tires of 3 in. thickness, shrunk on cast spoked wheel centres.

2. 486 failed wheels, of chilled cast iron. They are of different sizes, being 26 in., 28 in. and 30 in. diameter. They were used under freight and passenger engines, with weight on truck varying from 25,000 to 28,000 lbs.

3. 1,182 failed wheels of chilled cast iron, used under tenders of engines in freight and passenger service; size, 30 in. diameter.

Your Committee would recommend that the Secretary of this Association be directed to have printed blanks of the following form, showing all wheels removed from engines; and that the members of this Association be requested to fill out these blanks as far as possible, and to return them to the Secretary for each year ending Dec. 31; also that the

spokes and hub, he giving reason that there was additional weight thus given for adhesion, without the additional axle friction.

**American Railway Master Mechanics' Association Wheel-Blank.**

RAILWAY STATEMENT OF \_\_\_\_\_ INCH WHEELS  
REMOVED DURING THE YEAR ENDING DEC. 31, 187-.

KIND OF WHEELS.	No. of each kind.	POSITION UNDER ENGINE.						Average time in service.	Average mileage.
		1	2	3	4	5	6		
Chilled Iron.									
Solid Steel.									
Cast Centre in Steel Tires shrunk on.									
Cast Centre and Steel Faces.									
Other kinds.									

KIND OF WHEELS.	AVERAGE COST.		CAUSE OF REMOVAL.				Remarks.
	Total cost.	Average cost per 1,000 miles run.	Cost of mounting and turning tires and faces.	Flat wheel from skidding.	Spots in wheel.	Broken tread.	
Chilled Iron.							
Solid Steel.							
Cast Centre in Steel Tires shrunk on.							
Cast Centre and Steel Faces.							
Other kinds.							

From the reports made on axles, seven prefer steel axles, and three iron axles for engine trucks, and six steel axles and four iron axles for tender trucks. For driving-axles nearly all prefer steel.

different plans offered, from that of one master mechanic who "figured a little and then guessed at it," to that of D. K. Clark, which is reproduced in Forney's "Catechism of the Locomotive," in which work, commencing on page 328, a comprehensive treatment of the subject is given.

The following are the plans as found on the replies to our circular:

1. "Figure a little and then guess at it."  
2. "Counterbalance revolving and reciprocating parts, placing the weights as far from the centre as possible, and allow for distance accordingly."  
3. "Counterbalance by filling hollow wheels with lead. We fill five spokes and the rim between them. In small wheels we have to balance between the spokes, in addition to the lead."

4. "I find that in counterbalancing it becomes necessary not only to counterbalance the weights of the rod and other attachments to the rods and axles, but that there is a cushion in cylinder and the momentum of the rods to overcome. Consequently I balance weight of rods perfectly, and then add 30 per cent. of the weight counterbalanced. This gives me a very perfect and steady engine."

5. "Ascertain the weight of metal in arm of crank projecting beyond the diameter of hub. Add to this half the weight of the connecting-rod. Counterbalance this by cast-iron plates fitted to spokes and rim of wheel and held together by bolts—of course, the difference of leverage of the weights being taken into consideration."

6. "Have experimented and found that the following plan gives a perfect balance: Weigh the piston, cross-head, main-rod and side-rod of one side. Two-thirds of the whole weight balance in forward drivers, one-third in back drivers."

The mode of doing it: "Support the drivers by resting the journals on two parallel pieces of iron, leveled, then suspend the required weight on the crank-pin. Add enough weight on opposite side of crank to balance. Then take the weights, as they are commonly of irregular shape, and place them in some vessel of water, thus finding how many cubic inches of displacement, or ascertain the same by calculations. Knowing the weight of iron by the cubic inch, it is easy of ascertaining the required bulk."

Example: Piston, 122 lbs. + main rod, 233 lbs. + side rod, 209 lbs. + cross-head, 80 lbs. = 674 lbs.  $\frac{2}{3}$  of 674 = 449  $\frac{1}{3}$ , front wheels;  $\frac{1}{3}$  of 674 = 224  $\frac{2}{3}$ , back wheels."

"I usually calculate the amount of counterbalance required to balance the revolving parts, such as the lower end of main rod and parallel rods and crank-pins and hubs of each wheel, and assign the proper amount to each wheel. I also divide the reciprocating weights—cross-head, piston,



plunger and upper end of main rod—equally between the two wheels, giving rather more to the front wheels if any difference is made, and always giving rather less than more counterbalance weight than the weight of the parts to be balanced. I then calculate the centre of gravity of the counterbalance, making due allowance for its distance from the centre as compared with that of the crank-pin. I prefer balancing the moving parts by pouring lead into the spokes and rim, if the wheels are so made, and if not, to cast the balance in between the spokes. After the wheels are drawn on the axles, I generally raise them off the ground and allow the journals to rest on parallel iron strips. I then hang the proper weights on the crank-pins and correct the balance to suit, if they are much out of the way. I prefer to have an excess in front pair of wheels, and a deficiency in back pair. Do not like the practice of some builders in making same pattern of wheel for back and front axle, and same amount of counterbalance, as I consider that it exerts a severe strain on the parallel rods. Always prefer that there should be less counterbalance than is theoretically necessary, than to give an excess."

For the plan laid down by D. K. Clark, please refer to Mr. M. N. Forney's "Catechism of the Locomotive," beginning at page 328.

In conclusion, your committee regret that they cannot give any more information in regard to the relative cost of iron and steel wheels, and again urge upon the convention the necessity of adopting the plan they have submitted—or some other one—for collecting the necessary data, which will enable the Association to solve this most important question.

Yours respectfully,  
T. M. WILDER, Master Mechanic, Erie Railway.  
JOHN ORTTON, Mechanical Engineer, Canada Southern Railway.  
PETER CLARKE, Master Mechanic, Northern Railway of Canada.

#### Principio Passenger Station.

Our engravings this week represent another of the stations on the Philadelphia, Wilmington & Baltimore Railroad. The one represented is built of wood and combines with the station a dwelling house. The engravings show the ar-

Furthermore, as such results as the last five years have witnessed throughout the world have hitherto been unknown, the cause of them must be different, not of degree only, but of kind—in short, new.

Over-trading is usually spoken of, but that is as old as commerce. Over-production would seem to be nearer the mark, but there cannot be too much of anything produced except relatively. How can too much wheat, corn, cotton, rice or sugar be produced provided they are reasonably well proportioned? And the same is true of manufactured goods, qualified only by the temporary excess occasionally produced by some new invention, or marked improvement in methods. In short, great production in the fields, factories, mines and shops of the world means activity, progress and wealth—not depression and poverty. Diminished consumption, in its effects, is but the alternative of over-production, for it is plain that any production that is not required is excessive. But is there lessened consumption? Granted that in numerous individual cases there has been curtailment. On the other hand the natural increase of population in the world, the enfranchisement of the slaves in this country and of the serfs in Russia, the progress of liberal institutions, the increase of lines of communication by sea and on land, and the opening up of vast regions in all parts of the world to traffic—which things are true of the past ten or fifteen years—fully offset it; if, indeed, they do not greatly over-balance the admitted increase of manufactured and agricultural products.

Why then, it will be impatiently asked, the apparent, even palpable, excess of production over consumption? The answer, I believe, is found in the enormously increased facilities of communication and transportation which has been brought about during the past 12 years, mainly in the last 5 or 8. The extension of the telegraph into every nook and corner of the civilized world and to all important points in the half civilized regions, and the connection of the land lines everywhere by ocean cables, has brought the whole commercial world into instantaneous communication. Buying and selling are thereby astoundingly facilitated.

At the same time, the prodigious extension of the railroads throughout the world, the vast increase of steamship traffic, the completion of the Pacific Railway, and notably the opening of the Suez Canal (happening almost simultaneously),

transportation consequent upon the rapid extension of telegraph lines all over the world and their connection by submarine cables—the vast increase of steamship traffic and the opening of the Suez Canal, whereby the products of the world were thrown on the markets—weeks, months and even a year sooner than they otherwise would have been.

IV. So far as there is any present excessive supply of products, it is more apparent than real, for, if the "hand-to-mouth" buying, which has been so general for years past as to have become a stereotyped expression in all commercial reports, were from any cause abandoned, even for a few weeks, the excess, now exclusively in the hands of manufacturers, would be so distributed as to be no longer even "apparent."

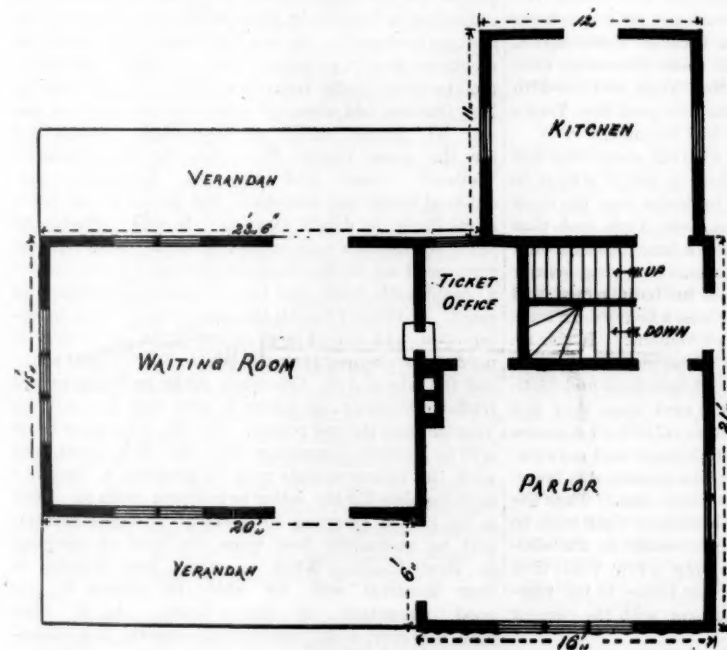
V. The inevitable conclusion from the foregoing is, the world is not and has not been producing too much, or more than it is, and has been consuming, but only that it has marketed more than it has produced.

If my theory is sound, and my reasoning has done it justice, the question of moment just now is, Have the full effects of this revolution been felt?

I think it has. No further considerable progress can soon, if ever, be made in either communication or transportation; there can, therefore, be no repetition of this experience even in a modified form. Not only is the worst past, but is all over and forever. The effect would have been greatly modified if the cause had been recognized in time; indeed, it would not be too much to say, it would have been well nigh neutralized by a full recognition, as it would have been seen that it must be temporary and limited. The extent of the influence has been due in a great measure to its hidden nature and to the universal belief that the cause, whatever it might be, was permanent.

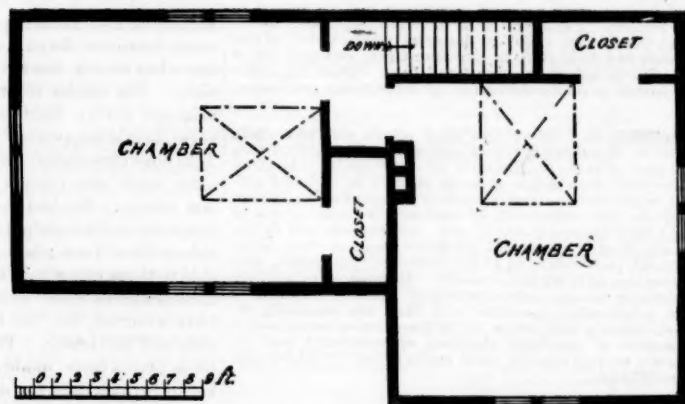
And time enough has now elapsed since the change began for it to have accomplished its perfect work.

It only remains now for something, anything, to happen to restore and establish general confidence. In this country, the favorable turn in financial matters, warranting the belief that specie resumption is at hand at an early day, will go far toward accomplishing this result, while a settlement of the Anglo-Russian quarrel would doubtless produce a like result in Europe; but whether or not either or both these things happen—if consumption has not only been equal, but also



PRINCIPIO PASSENGER STATION, PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD.

S. T. Fuller, Chief Engineer.



rangement very clearly, so that no further description is needed.

#### Quicker Transportation as a Cause of Temporary Over-supply of Produce.

The following letter appeared in a recent issue of the New York Daily Bulletin, dated at New Haven, May 11, and signed "W." There can be no doubt of the tendency of quicker transportation to increase the supply available to the consumer, but we believe that "W." has overestimated greatly its actual effect:

The panic of 1873 was anticipated by many. Indeed, it was so inevitable that a revulsion should follow the excitement—the inflation of the currency (and consequently of all values) and the extravagance of expenditure which characterized the ten preceding years—that few men were so dull as not to expect a collapse. The only question was, When?

But I think very few anticipated what has really happened. Five years of panic, so to speak, is something the modern world at least had never known, and, therefore, not expected. After other similar revulsions the process of recovery set in speedily, and in a few years the commercial world was well on its feet again, full of heart and hope, and eager for new enterprises.

Yet, in view of the wonderfully increased facilities of communication and transportation which characterize the present time—tending, as they undeniably do, to quicker results—was it not reasonable to anticipate a speedier rather than a slower recovery than formerly?

What then, has so effectually stood in the way? It will not do to say that our inflated and, therefore, depreciated currency has been the stumbling block, for other nations, using a sound currency, have floundered as hopelessly as we. Neither has our unwise tariff nor political disquietude been controlling factors in the problem, for we have not been without them when hitherto successfully struggling to recover from commercial depression, and are not all of them local—peculiarly American? and if strictly American the consequences of them should and would be almost wholly confined to America. Yet, we see the whole world suffering the same paralysis, and in as severe a form as ourselves.

It seems certain, therefore, that the real cause lies deeper than in any similar crisis hitherto experienced. It must be a cause, too, as universal as its effects are world wide. And,

have revolutionized trade and commerce to an extent not yet intelligently recognized.

The world has been staggering under a blow without knowing whence it came!

Is it asked, how do these things produce the results which I claim? I answer, by precipitating, so to speak, the productions of the world upon consumers—"out of time." Formerly—and only a few years ago—buyers went in person to make their purchases, or else ordered by mail. Getting their supplies by slow routes, they necessarily bought in advance of their customers' needs, and in excess, too. The plain result of this was an enormous quantity of goods of all sorts always in transit and in stock—this of domestic trade.

But consider the amazing change in foreign commerce, a good illustration of which may be found in East India cotton and its product. Scarce ten years ago, much of the cotton grown in India was taken to Bombay or Madras in carts drawn by bullocks (often, by the way, in the seed), a trip requiring weeks, there it was prepared for shipping, and when ready was laden on slow sailing vessels and sent to Liverpool by way of the Cape of Good Hope, a voyage of six or eight months. After being leisurely taken to Lancashire and made into goods, it was sent on its return voyage to India and China, reaching the consumer in those countries in not less than two years after it was grown. Now, with prompt railroad communications, India cotton reaches Bombay readily, is dispatched by steamers through the Suez Canal and reaches Europe within two or three months after it is picked; it is promptly returned in the form of cloth. It is not certain, therefore, that during the years under review, at least, one full India cotton crop had been marketed, made into goods, and thrown on the market of the world ahead of time? Or, to state the case differently, the world has, during the last five or eight years, taken one crop of India cotton (and consumed it, for the stock is less by about 500,000 bales than it was four years ago) more than has been grown.

The effect, then, of the revolution I have spoken of, has clearly been to well nigh annihilate both the stocks and the goods in transit, and the "annihilation" has, of course, been by consumption. The points I make are:

I. The panic was inevitable and anticipated.  
II. Its unexpected intensity, universality and prolongation, prove that some powerful and unrecognized factor was in operation.

III. That factor was a revolution in communication and

lutely greater, during the past ten years, than production—the fact will assert itself before long, and in the meantime it is idle to talk of further diminishing values.

#### THE SCRAP HEAP.

##### The Telephone on a Railroad.

The telephone has been adopted on the mountain section of the Central Pacific. The Truckee (Nev.) Republican says: "The points supplied with new batteries are Truckee, Blue Cañon, Summit, Cascade, Strong's Cañon, Yuba Pass, Tamarack and Camp 3. The main office is at Blue Cañon, and each track-walker is compelled to report to it both in passing east and west by the box telephones, which are to be placed at distances of a very few miles apart. By this means the finest and safest order can be preserved on the railroad that is possible to be obtained. As to the working of the instruments, they are almost perfect. When one becomes accustomed to talking and using them the lowest tone of voice can be heard and used to perfection. We had the pleasure of conversing with many of the station agents, and could also hear when persons were being addressed. A song, laugh or even an uncommon noise is heard readily, and the different voices of the communicants can be discovered."

##### American Switches in Sweden.

The Polytechnic Review says: "The Wharton switch, through E. L. Perdriau, of Philadelphia, has been introduced into the kingdom of Sweden and placed on the Malmö-Ystad Railroad for a test, and has passed through an arctic winter without accident of any kind. A report expressive of satisfaction with its working has been sent by Count Fredrik Arvidsson Posse, late Royal Swedish Commissioner to the United States, who is engaged in the construction of a coast line of railroad running from Engelhaven to Göteborg, a distance of about 143 English miles, and it is more than probable the Wharton switch will be used on this railroad."

"The progress made in the introduction of goods of American manufacture in the Swedish and Norwegian markets in the past few months, through Dr. Lindahl, Swedish Commissioner, and the Hon. Lorin Blodgett, and through the Bureau of the Associated Industries of the United States is very encouraging, and there is no reason why the north of Europe should not, when made better acquainted with the facilities for conducting such a trade, furnish an outlet for many thousands of dollars' worth of merchandise and products of the United States annually."





Published Every Friday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

## CONTENTS.

Page.	Page.
ILLUSTRATIONS:	GENERAL RAILROAD NEWS:
The Running Gear of Cars 241	Old and New Roads..... 249
Principio Passenger Station..... 242, 243	Master Mechanics' Convention..... 246
CONTRIBUTIONS:	ANNUAL REPORTS:
The Running Gear of Cars 241	Greenville & Columbia..... 250
Copyright on Blanks for Car Reporting..... 245	Mobile & Montgomery..... 250
EDITORIALS:	MISCELLANEOUS:
Winter Grain Receipts at Atlantic Ports..... 244	Report on Form and Materials for Locomotive Wheels and Axles, and on Counterbalancing..... 241
Quick Transit as a Cause of Industrial Depression..... 245	Quicker Transportation as a Cause of Temporary Over-Supply of Produce..... 243
Record of New Railroad Construction..... 245	Items of Cost of a Passenger Car..... 245
EDITORIAL NOTES..... 245	Sir Henry Tyler on the Grand Trunk Rates and American Competition..... 246
GENERAL RAILROAD NEWS:	Account of the Election of a Railway Bridge at Grand Rapids, Mich..... 247
Meetings and Announcements..... 247	
Elections and Appointments..... 247	
Personal..... 248	
Traffic and Earnings..... 248	
The Scrap Heap..... 243, 249	

## EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Addresses.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## WINTER GRAIN RECEIPTS OF ATLANTIC PORTS.

The receipts of grain of all kinds at the seven Atlantic ports for the 21 weeks during which navigation was closed, Dec. 1 to April 27, were as follows, in bushels, for two years past:

	1877-78.	P. c. of total.	1876-77.	P. c. of total.
New York.....	29,653,298	40.8	12,921,804	31.4
Boston.....	5,782,170	7.9	4,795,190	11.7
Portland.....	1,436,121	2.0	766,473	1.9
Montreal.....	71,969	0.1	123,965	0.3
Philadelphia.....	14,131,980	19.5	7,339,150	17.8
Baltimore.....	15,165,200	20.9	12,193,794	29.6
New Orleans.....	6,395,563	8.8	2,991,004	7.3
Total.....	72,616,301	100.0	41,131,389	100.0

There being an increase of nearly 80 per cent. in the aggregate receipts, it is not at all surprising that every place but one shows a large increase in receipts; our interest is in comparing the proportions of the total received by the several places. We see that New York, Portland, Philadelphia and New Orleans have improved their positions, while Boston, Montreal and Baltimore have lost. As between New York and its two chief rivals taken together the changes are:

	1877-78.	1876-77.
New York.....	40.8 per cent.	31.4 per cent.
Philadelphia and Baltimore.....	40.4	47.4

This year, therefore, Philadelphia and Baltimore taken together have received almost the same amount as New York; last year they received 50 per cent. more. New York has gained a little more than they have lost.

Taking New York and Boston together, and comparing them with Philadelphia and Baltimore, as illustrating to some extent the success of the different railroad routes in the two years, we have:

	1877-78.	1876-77.
New York and Boston.....	48.7	43.1
Philadelphia and Baltimore.....	40.4	47.4
Four ports.....	89.1	90.5

We thus see that the four ports together received almost the same proportion this year as last, but last

year the two southern ports received 52½ per cent. of the aggregate of the four, and this year but 45½ per cent. This shows that the northern roads carried a much larger proportion of the grain the last winter than the year before, and this is probably due to the fact that there were very large shipments of wheat last winter, and very small ones the year before.

The very small decrease in the proportion of the aggregate receipts at these four ports also shows how very slight a change was caused by the increased New Orleans movement. The receipts of the twenty-one weeks there were less than four weeks' receipts at New York, and the gross increase of New Orleans receipts but about one-fifth of the increase at New York.

The very large increase in the aggregate movement is probably wholly due to the large grain crops and the heavy foreign demand. There would not have been so heavy a movement if the rail rates had not been low, doubtless; but actually the grain was probably carried at about as low prices in the winter of 1876-77 as last winter.

The distribution of the receipts among the different ports is something of a test of the effect of the present established differences of rates. We cannot be certain that the agreed differences were actually maintained either winter, for the agreed rates were not maintained in either. But last winter, at least, there was no controversy between the companies as to the differences to be made, and when rates were "cut" to New York, they were probably cut by the same amount to Philadelphia and Baltimore. Thus the result of the last winter's business seems to indicate very fairly the effect of a difference of three cents per 100 lbs. in favor of Baltimore, and two cents in favor of Philadelphia. We may say roughly, that with these differences two-fifths of the grain has gone to New York, and one-fifth each to Philadelphia and Baltimore, and New York's proportion is the largest it has had recently.

It is not to be assumed that with the same rates and the same differences the distribution would always be the same. So far experience indicates that the chief exports of wheat will be from New York, and that Baltimore and Philadelphia have a large business only when there are large corn exports. Now last winter there has been a heavy business in both wheat and corn. The winter before there was a heavy corn business and a very light wheat movement. If the reverse should happen—a heavy wheat movement and a light corn movement—probably Philadelphia and Baltimore would stand much lower in rank than they did last winter. We had in the winter of 1876-77 a season favorable to Philadelphia and Baltimore and unfavorable to New York; last winter the season was favorable to those cities and to New York also. Thus the circumstances most unfavorable to New York seem to have occurred, but not those unfavorable to Philadelphia and Baltimore. For it is only a few years that these places have made a sufficient figure in the market to furnish data for a comparison with the current of traffic as it now exists.

It would seem that the traffic of last winter ought to be satisfactory to New York. Its grain business was much the largest it ever had in the winter, and a larger proportion of the whole grain business of the country than it had had for some years previous. If so, it is pretty good evidence that the present differences in rates in favor of Philadelphia and Baltimore are not serious obstacles to its trade. It must be remembered that these results are for the period when navigation was closed, and that New York is the only one of the four ports named that profits materially by the water route. If it can get two-fifths of the grain when the railroads alone are carrying, certainly it should have nothing to complain of when the canal is adding its contribution. Last year it received nearly 50,000,000 bushels by this route, though three months of the season the movement was very light, for want of grain to carry. Certainly if the railroads continue to serve it as well as they did last winter and the canal is as effective as it was last year, New York can have nothing to complain of, unless it is unwilling to have the other ports do any grain business.

What it has to fear, however, is that in summer rail rates may be made as low as water rates, and traffic be diverted from the canal, which carries to New York alone, to the railroads, which carry to all the ports. The effect of this was shown very clearly in 1876, when with the lowest rail rates ever known and the differences against New York certainly not greater than now, and perhaps less, its proportion of the total grain receipts was the smallest ever known. This ought not to need any explanation; but it seems that it does, for we find New Yorkers anxious to have their railroads reduce their rates and bring on a conflict with their Philadelphia and Baltimore competitors, the inevitable effect of which would be that a large proportion of grain would go to the Southern ports. It is, as mat-

ters stand, for the advantage of New York that rail rates on grain should be as high as possible both winter and summer—high enough to prevent any considerable shipments by rail. Then nearly all the grain intended for export will be forwarded by canal and so enter New York harbor and pay toll to New York merchants. It is apparently inevitable that hereafter there will be a heavy winter movement by rail; but in summer this cannot now occur except when either the lake and canal boats are charging high prices or the railroads are carrying for less than cost, for the water route still evidently can carry at much less expense than the railroads. New York's supremacy was in the first place due to the fact that it had much the cheapest connection with the interior. The other advantages, many and great, of accumulated capital, established trade, abundant shipping, connections with all parts of the world, and the like, are largely the results of that original advantage. Now, in all probability, it will have to depend largely and perhaps chiefly upon these secondary advantages; so long as rail rates are higher than water rates it preserves this original advantage; when they are as low, it loses it. The great reductions in the cost and price of railroad transportation of late years have tended to put all ports substantially on a level, so far as connections with the interior are concerned. And all future progress in reducing the cost by rail will tend to confirm this equality. What is most likely to interrupt this tendency toward equality is not any action of the railroad companies, but the improvement of water routes and the reduction in freights by these below even the very low charges now made. In two directions such improvements are now in progress, both of which, however, tend to divert traffic from New York. One of these, by New Orleans, has attracted much attention, but it has yet to prove itself a formidable competitor for the grain traffic; the other, by the improved Welland Canal and the St. Lawrence, has received much less attention, but seems to us much more likely to divert exports. It will probably be ready for use in a year or two. But the New Orleans route need not be the cheapest route in order to attract a considerable traffic and have a material influence on rates. It differs from all the other water routes in being open, and indeed most favorable, in the winter. It needs to be cheaper than the lake and Erie Canal route and the lake and St. Lawrence route in order to get traffic in summer; in winter it need only be more favorable than the rail routes. The St. Lawrence route will be a direct competitor with the Erie Canal, and with the improvements now in progress it does not seem possible for the latter to compete with it. That is, the cost of carrying to Montreal, it seems certain, will be materially less than the cost of carrying to New York. What is much less certain is that Montreal will be able to export to as good advantage as New York. As it does now, however, make considerable exports, it is reasonable to suppose that when the largest lake vessels can run through without obstruction from Chicago and Milwaukee to Montreal, the latter place will be a much more formidable competitor for the grain export trade than it has been hitherto, and take business from Baltimore and Philadelphia as well as from New York. If so, the railroads can do little to neutralize its competition except by carrying grain largely in the winter, when Montreal cannot export; for if summer rates by water are much lower than they now are, we may be sure that grain will not move freely by rail, even at the recent low water rates. So far as the railroads are concerned, we doubt if they would lose much by such a diversion of grain exports. If the diversion is made, it will be by a material cheapening of the total cost of exporting. But such a reduction would stimulate cultivation and production in the Northwest, and probably cause a considerably greater increase of population and wealth there than would otherwise occur, and with it an increase in the passenger and merchandise traffic, which can be made to pay a considerable profit, to take the place of the grain traffic, which, from the great Northwestern markets to the seaboard, cannot be made to yield anything more than a very minute profit under ordinary circumstances. And as to the Northwestern railroads which can get remunerative rates for carrying grain, there can, of course, be no doubt that they profit by every reduction in the cost of carrying from those markets to the consumers, and the greater the reduction the better for them.

But we lose sight of the main object of the present investigation, which shows, we think, that the present railroad policy is favorable to the grain business of New York, and that with the present difference in favor of Philadelphia and Baltimore, and a paying rate maintained by rail while navigation is open, it is in no danger of losing its supremacy in the grain trade.



**Quick Transit as a Cause of Industrial Depression.**

A correspondent of the *New York Daily Bulletin* in a letter which we republish elsewhere makes some suggestions concerning the cause of the present industrial stagnation which seem to us well worthy of attention, not so much because we believe that he has found the cause of our troubles, as because he points out one immediate effect of increased speed in the transportation of freight which seems generally to have escaped attention. This is that the stock of material of any kind which it is necessary to have in existence at any one time is reduced by increasing the rapidity with which such material is carried from the producer to the consumer.

If producer and consumer were in all cases the same, or living side by side, and production was continuous, then it would never be necessary to have more than one day's consumption on hand at any one time. Let us imagine firewood to be the material, and the consumers to live in a forest; they could be fully supplied all the time and still never have more than a day's supply of wood cut. But now imagine the community of consumers to be two hundred miles distant from the wood, and accessible to it only by a highway to pass over which a load of wood requires seven days. Now no greater production of wood is needed to supply the demand, but there must be at least seven days' supply prepared in advance of consumption, that amount being always on the road. Thus a considerable capital must always be invested in the stock in transit. But suppose after this condition of things has prevailed for a while a railroad is opened between the place where fuel is produced and that where it is consumed, bringing it through in one day. Now suddenly the stock necessary to keep the current demand supplied is reduced from seven to one day's supply, and the market is glutted, and will continue to be overstocked until production has been reduced sufficiently to permit the six days' stock to be consumed.

In certain goods this effect would be very great. There have been some, doubtless, that were six months or more in reaching the consumer. Reduce this time to one month, and you have at once five months' production, or five times the ordinary supply at one time, thrown upon the market. Now a reduction in the amount produced equivalent to 8 1/2 per cent. would have to continue for no less than five years in order to reestablish the old and proper amount of stock in the consumers' market at one time. It is as if trees requiring naturally a hundred years to grow large enough for timber should by some improved culture be made to mature in one year. Suddenly all those intended to supply a demand 99 years from now, and for every year until then, would become available to the current demand, and the tree-planting industry, if there were such a one, would be destroyed for 99 years.

The cases which the *Bulletin's* correspondent especially cites are the lessening of the time of shipments from India and China by the Suez Canal and the Pacific railroads, where the saving may have had considerable effect on goods shipped to those countries as well as on the products shipped from them.

But, while it is important to understand and take into consideration this effect of improved transportation, we do not find it a sufficient explanation of the existing industrial stagnation. If all or most products had been, previous to 1870, usually several months in transit, and if the recent improvements had greatly shortened that time for all or most of them, then this explanation might be accepted. But actually the reduction of the time of transit on most articles of consumption was made long ago, by far the larger part of the productions of the world, even of manufactured articles, are consumed, and have been always, within a few days' journey of the place of their production, and no possible reduction in the transit of these could have a serious effect on the production of a year, not to say four or five years. Although the railroad system of the world, and of this country especially, was enormously increased from 1867 to 1873, the average time of transit of freight was not very greatly reduced thereby. The great effect of such a line as the 2,000 miles from Omaha to San Francisco is very striking; but it is a great error to assume that a similar effect was caused by 20,000 miles of other roads in this country, which are for the most part simply alternative routes. Grain comes forward no faster from Chicago to the seaboard because there are four or five roads than if there was but one.

More effect on industry, it seems to us, was caused by the burying of the world's savings in these same new railroads and other enterprises which make little or no return, and the interruption of the vast consumption which the construction of these new works caused. As a Belgian economist, M. George de Laveleye,

has put it, "the world is equipped," and the discovery is made only when a very large share of the productive energies of the world are directed to industries engaged in equipping it. This is an exaggeration of an undeniable fact; but it is nevertheless true that a very large share of the capital and labor of the world, recently required to improve and increase the costly productive appliances of the world—especially railroads and iron works—have suddenly been found to have overdone their work, and to have insufficient present employment and little prospect of sufficient future employment; and to turn these productive energies, or the surplus of them, from the channels in which they are not needed and in which the world now utterly refuses to use them to other channels in which their production will be useful and available, is a work of time and difficulty. It is so, in the first place, because those engaged in any industry are slow to learn that the field of that industry is permanently contracted; and, in the second place, because even when so convinced, it is extremely difficult to ascertain what new industries will be supported; for the contraction of industry in one direction implies its expansion in another. Producers have first to learn what they must give up, and then what they can take up, and time is needed to teach them.

**Record of New Railroad Construction.**

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

**Detroit & Bay City.**—The first track is laid on the *Caro Branch* from Vassar, Mich., northeast 5 miles.

This makes a total of 312 miles of new railroads completed in the United States in 1878, against 354 miles reported for the corresponding period in 1877.

LAKE RATES have been materially reduced, doubtless in consequence of the lower rail rates. Until Wednesday, the 8th, 3 1/4 cents per bushel for wheat and 3 cents for corn had been the lowest rates of the season. As we noted last week, that day the rates were lower, and now and for more than half of the past week 2 cents for corn and 2 1/2 for wheat have been accepted. As we have said, the vessels will take the grain, even if they have to accept less than the present unsatisfactory rates. Canal rates as yet seem not to have been affected, but they probably will be if the railroads continue to carry at the prices accepted recently. Meanwhile ocean rates are well maintained, as is natural. The less the price from the farm to the seaboard, the more can be charged from the seaboard to Europe, and the greater the demand on the ocean vessels. About 8 1/2 cents a bushel for corn and 9 1/2 for wheat will now pay for carrying from Chicago to New York; and for 16 cents more the grain is delivered in Liverpool. The actual prices now for a certain grade of wheat are \$1.11 per bushel in Chicago, \$1.27 in New York, and \$1.45 in Liverpool (the latter as nearly as we can judge from the reports). A year ago, when there was little grain to carry, the cost of carrying from Chicago to New York was a little less, and that from New York to Liverpool was but about one-half as great. But the rates now are probably the lowest that have been charged when there was a heavy traffic.

THE CHICAGO, MILWAUKEE & ST. PAUL COMPANY adds to its system by the purchase of a controlling interest in the Madison & Portage Railroad in Wisconsin, and the Dubuque Southwestern in Iowa. Neither of these is important, but they can be worked better in connection with a great company, doubtless, than as independent roads. The Madison & Portage is doubtless worth more to the new owner than to any one else, as it is between two of its east and west lines. The Dubuque Southwestern, however, would seem to fit better with the Iowa Division of the Illinois Central than with the Milwaukee & St. Paul. Its course is from Farley, which is on the Illinois Central, 23 miles west of Dubuque, southwestward 56 miles to Cedar Rapids, and its connection with the Chicago, Milwaukee & St. Paul is at Marion, within six miles of Cedar Rapids. To pass over the latter road the traffic from it must first move southward to Marion, thence east to the Mississippi at Sabula, and thence northwest over the Western Union, and the distance from Farley to Milwaukee by this route is 294 miles, while by way of Dubuque it is but 210 miles. The gross earnings of the road in 1876 were \$2,060 per mile; the net, \$220.

The Madison & Portage road has nearly always been worked by the Chicago, Milwaukee & St. Paul. It is 39 miles long, from Madison north to Portage. For the year ending with September, 1877, it earned \$990 gross and \$130 net per mile. These two roads together, for the years reported, earned net \$17,050, so they cannot by any means be called important.

THE TRANSPORTATION OF LIVE STOCK again engages the attention of Congress, the House Committee on Agriculture having reported a bill limiting the time of confinement of cattle in cars, without feeding or watering, to 24 hours. The owners of the patents for stock cars in which cattle can be fed and watered, the chief of whom is said to be a certain member of Congress, are urging the passage of such a law as a measure of humanity, ostensibly to the cattle, but really to themselves. But the chief live-stock shippers, whose prosperity depends to a very great extent on the condition in which

they deliver the animals at the markets where they are slaughtered, actively oppose the passage of the law, and assert that a through journey in a "palace" stock car is more injurious to the cattle than the transportation as now conducted, with intervals of rest and feeding at transfer yards. As we have said before, this is a case in which the interests of the shippers coincide, to a very great extent, with the good treatment of the animals, and if a real improvement in the method of transporting them is introduced they may safely be trusted to adopt it for their own profit.

EAST-BOUND RATES continue demoralized, with no present prospect, so far as we can ascertain, of their restoration, though there was a rumor to that effect on the New York Stock Exchange last Tuesday, where a false report is sometimes as serviceable as a true one. Still, the rates may be restored any day, as there is no question at issue between the companies. Rates are of course irregular, but the Chicago papers report 18 cents to New York for grain and fourth-class freight as the common rate, which is a little less than 0.4 cent per ton per mile by the shortest route. Possibly it is as well to take freight at this rate as to lay up the engines, but as in most cases there is nothing to carry back, the cost must be very low indeed to make this true.

**Copyrights on Blanks for Car Reporting.**

OMAHA, May 9, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A statement has been made that the Davies system is not copyrighted. Does this include the entire system, or simply the individual mileage blanks?

Many roads are anxious to have you state in the columns of your paper the facts in regard to both systems. I understand the junction exchange reports are not copyrighted, but the balance of the system belongs to F. M. Luce by copyright.

FACTS.

[We have already told all we know of these copyrights; but will be glad to learn more and tell it.—EDITOR RAILROAD GAZETTE.]

**Items of Cost of a Passenger Car.**

In the elaborate description of the Pennsylvania Railroad, published in *Engineering*, the following statement of the cost of each item entering into the expense of constructing a first-class passenger car at the Altoona shops was given:

Labor	\$1,263.94	3 Bronze lamps	13.50
Proportion of fuel and stores	28.61	2 bronze door-locks and fittings	15.20
Proportion of superintendent, chief clerk and storekeeper's time	13.53	1 Saloon door-lock	6.26
2,480 ft. poplar at \$35 per 1,000	86.80	3 Lamp "canopies"	2.43
3,433 ft. ash	127.08	3 Pairs bronze butt hinges	5.41
1,100 ft. pine at \$19	20.90	1 Pair 3 in. by 3 in. do. butts	2.43
2,350 ft. yellow pine at \$30	70.50	14 in. by 1 1/2 in. brass	.34
500 ft. oak at \$29	14.50	26 pairs brass butts	7.37
450 ft. hickory at \$30	13.50	1 drip pan	5.06
700 ft. Michigan pine at \$70	49.00	1 Urinal	4.25
400 ft. cherry at \$40	16.00	1 W. C. tube	6.30
439 ft. maple veneer	24.14	3 7-in. ventilator rings	2.43
4 pairs wheels and axles	332.85	2 brass bushings	.28
2 pairs passenger car trucks complete	533.02	5 Leather bell cord hangers	6.50
87 lbs. Color at 15 cents	13.05	2 Bronze bushings	2.44
13 lbs. Putty at 12 cents	1.56	1 10-in. ventilator rings	2.44
50 lbs. Hunter's paint at 12 cents	7.08	1 8-in. ventilator ring	.32
35 lbs. Oil filling at 12 cents	4.03	13 in. ventilator ring	.44
40 lbs. Filling at 13 cts.	5.20	13 Bracket racks	77.35
15 lbs. Tuscar red	3.75	2 Sash levers	42.00
2 1/2 lbs. Drop black	.70	2 Door holders	3.00
2 lbs. Lamp-black	.34	61 Bronze window lifts	24.40
2 lbs. Green	.32	61 Bronze window fastenings	16.47
Gold bronze	2.76	94 Bronze window stops	3.14
6 lbs. Pulverized pumice stone	.36	2 Coat hooks	.05
1 set gas pipes, etc.	1.17	3 Match lighters	1.17
3 Quarts black varnish	.66	1 Waste cock	1.85
1 Quart shellac	.66	28 in. Sheets tin 20 in. by 20 in.	34.17
3 gals. Varnish at \$4.08	12.24	60 Sheets tin 14 in. by 20 in.	6.27
10 gals. Varnish at \$3.83	38.30	14 lbs. Solder	2.24
1 gal. Linseed oil	.59	2 lbs. Rivets	.32
45 lbs. Glue	14.33	30 lbs. Tinned nails	.76
23 lbs. White lead	2.59	59 sq. ft. Wire gauze	.30
29 1/2 lbs. Iron	87.75	14 3/4 52 lbs. No. 12 sheet iron	2.73
Nails	2.25	2 1/2 52 lbs. Nails	.24
72 lbs. Square nuts	5.05	2 1/2 Pins, etc.	.08
158 lbs. Nails	5.52	2 Yards brown muslin	.08
Brass wire and small nuts and washers	.41	34 yards hat cord	4.08
792 lbs. Castings	16.99	Burlap sacking	.09
2 lbs. Spring steel	.17	98 yards scarlet plush	228.87
9 lbs. Washers	.63	44 yards plain green plush	109.99
6 lbs. Hexagonal nuts	.40	15 yards sheeting	10.30
119 lbs. Wagon box iron	5.59	15 yards buckram	2.79
Wood screws	4.05	52 yards flax canvass	8.32
Screws	51.88	1 yard 8 oz. duck	.18
31 lbs. Carriage bolts	.45	14 yards cocoanut matting	7.22
1 set gas pipes, etc.	7.19	1 Bell-rope	1.44
Gas burners	.22	2 1/2 lb. Thread	.08
Brass connections	.25	2 Tinned tacks	.14
1 Gas regulator	15.00	1 lb. Brass washers	.20
1 Gas gauge	10.25	12 1/2 yards 10 oz. duck	3.56
2 Two-light chandeliers	50.72	2 yards 6 oz. duck	.53
1 Gas bracket	3.9	1 1/2 yards ship canvass	.16
2 Gas tanks complete	84.00	Seaming cord	.04
2 Soldered joints	.40	5 gross plush nails	3.33
1 Air brake complete	131.79	5 gross plush buttons	2.82
1 Water cooler faucet	3.25	1 1/2 lbs. Tufting twine	.76
1 lb. Lead pipe	.80	1 lb. Spring twine	.23
1 lb. chain	.04	243 lbs. Hair	72.95
Screw eyes	.05	Tacks	3.68
57 Sash balances	44.61	12 Springs	22.96
27 lbs. Rubber draught packing	12.65	12 Spiral elliptic springs	20.29
31 Lights, white glass	26.11	22 Spiral springs	.92
25 Lights, plate glass	10.56	2 1/2 lbs. Lining nails	.50
25 Lights, ruby glass	27.72	1 Head lining	80.93
3 Extra lights	1.44	Flour	.15
Wood filling	.13	3/4 gallon sample varnish	2.37
12 Vertical registers	8.32	2 packets gold leaf	14.54
2 Stoves	77.56	2 gallons alcohol	7.81
50 Seat arms	8.50	4.84 Beeswax, etc.	.46
2 Bron'd sash fasteners	4.84	3.70 4 lbs. Sole leather	1.28
20 Brass alcoves	3.77	26 quires sand paper	5.72
25 sets of seat fixtures	50.50		
2 Bronze notice plates	4.00	Total	\$4,423.75
4 Notice frames and notices	2.44		



## MASTER MECHANICS' ASSOCIATION.

## Eleventh Annual Convention.

The eleventh annual convention met in Richmond, Va., May 14, and was called to order by President N. E. Chapman. The proceedings were opened with a prayer by the Rev. Dr. Chas. Reade, of Richmond, and a pleasant address of welcome was made by ex-Mayor Kelly. The roll was called and the following members answered to their names: J. M. Boon, G. E. Boyden, J. D. Barnett, N. E. Chapman, H. L. Cooper, Chas. H. Corey, W. A. Foster, Chas. Graham, S. J. Hayes, C. T. Ham, W. S. Hudson, C. W. Hollister, Jacob Johann, J. N. Lander, W. H. Lewis, Wm. Lannan, John McFarland, George Richards, J. H. Setchel, James Sedgley, John Swift, W. F. Turrett, Reuben Wells, W. Woodcock, M. N. Forney, F. B. Miles. The following new members then signed the constitution: Amos Pillsbury, Hartford, Providence & Fishkill; S. S. Pilsen, Louisville, Cincinnati & Lexington; James Maglen, Carolina Central; Robert King, Western Railroad of Alabama; Jas. Eckford, Cincinnati, Hamilton & Dayton; J. Minshall, New York & Oswego Midland; J. B. Johnson, Arkansas Central; George W. Reynolds, Boston, Clinton, Fitchburg & New Bedford; Thomas L. Chapman, Chesapeake & Ohio.

## PRESIDENT'S ADDRESS.

President Chapman then delivered his annual address, as follows:

GENTLEMEN: Permit me to congratulate you upon the favorable auspices under which we come together upon this our eleventh anniversary, the commencement of our second decade.

I think the members of this Association have reason to be proud of its permanency. One of the healthiest features in the events of the past year is the prompt manner in which many of the companies represented by you have responded to the circular which was drawn up by the General Supervisory Committee at a meeting held by said committee in St. Louis, after the adjournment of the convention, requesting the various railroad companies to donate a certain amount toward defraying the expenses of printing the proceedings or report of our annual meeting; which was promptly and heartily responded to by many of the railroad companies addressed.

On my way here I met in Cincinnati with our Secretary and First Vice-President, and visited the bank where our Boston fund is deposited, the nucleus of which was presented to the Association by the merchants and manufacturers of that excellent old city in 1872, a short time after our meeting there.

At our next annual convention, by order of the members it was placed in charge of the Supervisory Committee, who invested it in Government bonds as per your Secretary's report.

A train of thought was started in connection with this visit and discussed by us—whether the time would not come within a few years when the fund would enable the American Railway Master Mechanics' Association to have a building of their own, in which to hold their annual meetings and store the accumulation of drawings, etc., belonging to them and which are fast accumulating on the hands of our Secretary.

I throw out this idea to the members for what it is worth, and that they may consider the question at their leisure.

There is one subject which, although not exactly pertinent to those matters the discussion of which has brought us together, yet it is one deserving of as much, if not more, study and consideration.

It must be admitted by all thoughtful and candid men that the evidences are that the present condition of society is not healthy, and has not been, when we see such proofs of the antagonism of capital and labor as was displayed last summer. I refer to the great strike of last July, harmless enough in the beginning, perhaps, but ripening speedily into the most extensive riots the country has ever known.

It is not of the strike especially that I would speak, though that should not have been—not, perhaps, to have been prevented through any act of Congress or State legislatures, but through the self-interest of the men concerned keeping them from any such suicidal course of action as strikes have always proven to be, but of the riot which followed the strike, and the class of people who were the active element in it, and also of the support which it obtained during the first few days of its incipient existence from the popular feeling of hostility to railroads, to which even that most conservative class of people, "business men," contributed, until the riot culminated in the vast destruction of property at Pittsburgh, which alarmed the whole country.

All must admit society to be in a very critical state when a body of totally irresponsible men can seize upon a whole city, and with utter defiance of the lawful authorities place it under an actual state of siege, as Pittsburgh was, and yet have popular sympathy on their side.

I do not present this matter for discussion, or to advance any favorite suggestion of my own as a remedy, but only for your personal, careful consideration, in the hope that we, as individuals, may be able in our several localities of residence to in some degree so influence public opinion so that any similar occurrence may in the future be avoided.

Referring again to the strike, I recall to your minds the surprising celerity with which it spread from one end of the country to the other, to the very determined stand taken by the strikers, to the vast amount of authority which these wholly irresponsible parties arrogated to themselves, displacing general managers, master-mechanics, superintendents, masters of transportations and train-dispatchers, and appointing new men from their ranks to these important positions; and although all this was done for the ostensible purpose of protecting the property of the companies, there is no doubt that the striking firemen and brakemen were strengthened by a power stronger than themselves, who in part supplied the necessary brains and a great deal of the courage to carry on this extensive strike.

I would call your attention to the anomalous condition of that portion of our population known as tramps, who were so prominent in Pittsburgh last July, who infest our rural districts, and who, at every whisper of a possible disturbance in any of our large cities, rush in, intent to take a hand, for they have nothing to lose and everything to gain; any excitement which will give them a chance is hailed with delight.

Considering the moral and industrial characteristics of these people, I feel inclined to borrow a phrase from Bulwer Lytton, "What shall we do with them?" and ask, since these people are so dangerous to our business, social and political prosperity, Does it not appear necessary for our State and National governments to provide for this large and increasingly irresponsible portion of our population?

Our ranks have been again invaded by the common enemy of all mankind, the dread reaper, Death, and we are called upon to deplore the loss of one of our most genial and worthy members. I refer to the death of Edwin Garfield.

Mr. Garfield had been a member of this Association from its infancy, having joined in 1869, at our second meeting, which was held in Pittsburgh. My recollection is that he attended every meeting given since that time.

I trust suitable action may be taken expressing the sense of this meeting in regard to the sad event.

Great credit is due the various committees for the excellent manner in which their reports were compiled and presented at our last meeting.

The report of the Secretary was then read. It was received and ordered on file.

The Treasurer's report was received; it showed that the total receipts for the past year were \$2,451.07; the expenses were \$1,713.76; the balance on hand at the beginning of the year was \$51.94, which leaves a balance of \$789.25 on hand at this date.

It was resolved to appoint an auditing committee to examine the books and accounts of the Secretary and Treasurer, the same committee to make the annual assessment on the members. Messrs. Sedgley, Boon and Richards were appointed.

A committee of three was appointed to take charge of the correspondence, Messrs. Hollister, Turrett and Graham being appointed.

Mr. SETCHEL moved that twelve o'clock of each day be set apart for hearing and discussing questions presented by members.

The report of the committee on the "Best Form and Material for Locomotive Wheels and Axles, and also the Best Methods of Counterbalancing" was then read. This report is published in full elsewhere.

The report was received, and submitted for discussion.

Mr. LANDER spoke in favor of the recommendation of the committee to adopt a blank form and furnish reports of the service of wheels, and moved that this recommendation of the committee be adopted.

Mr. JOHANN said that he was afraid the Secretary would not be able to compile all the information which would thus be received.

Mr. HUDSON suggested that the weight carried by the wheels be recorded, and also how many of the wheels were subjected to the action of the brakes.

Mr. WELLS agreed with Mr. Hudson.

Mr. LANDER said that if the blanks were properly prepared, the labor to the Secretary would not be excessive.

Mr. FORNEY thought a special committee would be able to do the work better than the Secretary.

Mr. MILES said that the present committee could take charge of the matter.

Mr. LANDER considered that the records would be more likely to be kept properly if the Secretary kept them.

Mr. JOHANN said that what was needed was a standing committee with good, industrious members.

Mr. MILES gave as an instance the report on the expense of lubricants in which the results were tabulated, and thus excited an interest in the subject, and since then some useful and interesting experiments have been made.

Mr. SETCHEL said that Mr. Miles' allusion to the committee on lubricants was unfortunate, as it had entirely fizzled out this year; but he thought that the duties could be attended to by the Secretary, if the blanks were properly prepared. The subject of wheels had been much neglected, and at present, instead of removing a wheel and asking no questions, the first thing that was asked was, whose wheel was it?

Mr. FORNEY said that he thought that the committee should be instructed to prepare a form of blank for keeping a record of wheel mileage.

Mr. LANDER accepted an amendment offered by Mr. Woodcock, that the subject be referred to the present committee on wheels.

Mr. LANDER then withdrew his motion and moved that the whole matter be referred to the Committee on Subjects, which was carried.

The Secretary was then called upon for questions, if there were any for discussion during the special hour set apart for that purpose, but reported that there were none.

Mr. FORNEY then moved that a committee of three be appointed to solicit questions to be presented at noon the next day.

Mr. WOODCOCK moved to amend by adding to the duties of that committee that of preparing subjects for reports for next year.

The Finance Committee then reported that they had examined the accounts and found them to be correct.

The discussion of the report on wheels and axles was then resumed.

Mr. WELLS dissented from the Committee's recommendation regarding the proportions of driving axles. He objected to making the central part of the axle between the hubs of the wheels a quarter of an inch smaller than at the wheel-seat.

Mr. HAYES agreed with Mr. Wells, and said that the practice of the West was to make axles without a shoulder inside the wheels.

Mr. LANDER objected to an axle of the same diameter all the way between the wheels. His practice was to diminish the diameter of the axles at the centre.

Mr. HAYES asked how he arranged the eccentrics.

Mr. LANDER said that on American engines there was room enough between the eccentrics to diminish the size.

Mr. SETCHEL differed with Mr. Lander because experiments had shown that when an axle was loaded the distance between the flanges of the wheels was greater at the top of the wheels than at the bottom, and therefore he thought the thickness at the centre was needed to give rigidity.

Mr. LANDER asked whether the experiments were made with engine or car axles.

Mr. SETCHEL said they were made with car axles, but a similar action would take place with driving axles.

Mr. LANDER made his axles smaller in the centre, so that the spring of the axle would be more equally distributed.

Mr. HUDSON said the English practice was to make axles, he thought, as much as an inch larger in the wheel-seat than in the journal. The reason for making the wheel-seat larger was that the axles were held rigidly in the wheel, and therefore the vibrations ceased at the hub just as those of a fiddle-string would, if held in the same way.

Mr. HAYES agreed with Mr. Lander, and thought that diminishing the size of the axle in the centre would distribute the vibrations. He then gave an account of some experiments showing the spring of car axles.

Mr. SEDGLEY asked for information about the service of axles. He thought that reducing the diameter of the driving axles in the centre increased their life very materially. He thought 300,000 miles was about all that they could safely make.

Mr. WELLS gave an account of experiments which he had made in relation to the strength of different kinds of bars of iron.

Mr. FORNEY spoke in favor of the adoption of the Master Car Builders' standard axle for tenders and cars.

Mr. HUDSON thought that the importance of counterbalancing locomotives was not sufficiently realized. He knew positively that a locomotive not properly balanced would not make speed.

Mr. SETCHEL spoke in favor of recommending the use of the Master Car Builders' standard axle.

Mr. SEDGLEY said he did not think it would be wise to adopt that standard, as he understood it had been referred to a committee by the Master Car Builders' Association.

Mr. RUSHTON was in favor of an axle with  $3\frac{1}{2}$  by 7 in. journals, and thought that  $3\frac{1}{2}$  in. was quite large enough.

Mr. WELLS did not think that it was necessary to adopt a standard tender-axle. Each member could adopt the standard axle if he wished.

Mr. HUDSON asked whether the breaking of driving axles was not due to the keys used for fastening the wheels.

A communication was received from the Western Union Telegraph Company offering the use of its line to members.

Mr. RICHARDS then formally announced the death of Mr. Garfield.

A committee was then appointed to prepare a memorial of the late member for publication in the annual report. The committee consists of Messrs. Richardson and Miles.

The convention then adjourned until the next day.

## Sir Henry Tyler on the Grand Trunk Rates and American Competition.

From the speech of Sir Henry Tyler, President of the Grand Trunk Railway, at the recent half-yearly meeting, at which the report for the last half of 1877 was received, we make the following extract:

We had reckless competition to contend with for our merchandise traffic in the early part of the half-year, and only a partial diminution of it for the remainder. We were thus only able to derive a limited degree of advantage from the abundant harvest with which the country was blessed. While our tonnage was increased by 102,789 tons, and our ton-mileage by 58,198,841 ton-miles, the money receipts from our freight traffic were only increased by £138,513; and we received, on the average, only .80 of a cent per ton per mile for our freight, as against the still worse figure of .75 of a cent per ton per mile for 1876. The highest rates for grain and flour from Chicago for New England at any time current in the half-year were 45 cents per 100 lbs. for grain, and 90 cents per barrel for flour; while in 1871-2 they were as high as 70 cents per 100 lbs. for grain, and \$1.40 per barrel for flour; and they were never lower in 1871-2 than 50 cents per 100 lbs. for grain, and \$1 per barrel for flour. Looking back to the experience of the last six years, we find that the average earnings per ton per mile in the December half-years from 1872 were as follows: 1872, 1.38 cents; 1873, 1.44 cents; 1874, 1.10 cents; 1875, 1.00 cents; 1876, .75 cent; 1877, .80 cent; and the numbers of tons moved one mile were: 1872, 221,955,670; 1873, 238,797,449; 1874, 332,148,207; 1875, 342,712,047; 1876, 377,234,699; 1877, 435,433,534. So that we have, you see, been in the disagreeable position of continually and largely increasing the volume of our business, at the same time that the rate of remuneration for its transport has proportionately decreased. I trouble you with, and ask your special attention to, these figures, because it is desirable that we should all clearly understand our precise position, the difficulties that we have to encounter, the obstructions that lie in the way of our prosperity, and the remedies required to overcome them. It is not an increase of freight traffic that is wanted; we have as much as we could desire, and sometimes more than we can carry. It is not the means of conveyance that are wanting. We are able, as you observe, to carry enormous and continually increasing quantities. It is the one element of 'rates' that weighs us down, and prevents us from paying dividends, as we ought to do, if those rates were reasonable, upon all our stocks. It is the want of reasonable rates, also, which affects the question of our working expenses. They have been reduced, it is true, to 75 per cent., as compared with 80 per cent. for the corresponding half-year; and they have been kept at the lowest point consistent with efficiency. But we cannot properly maintain our undertaking, and carry 435 million ton-miles of traffic, below a certain fixed cost; and the relation of working expenses to gross receipts must, with the cost of maintenance and working reduced to the lowest point, depend solely upon this element of rates. We received as an average in 1873 nearly a cent and a half—say  $\frac{1}{2}$  d. per ton per mile, and the lowest average rate which we received for working our traffic prior to 1876 was a cent, or say  $\frac{1}{2}$  d. per ton per mile. That rate would, on the traffic of last half-year, have given us one quarter more on our freight receipts, or no less a sum than £179,000 of additional net profit, in addition to the £256,100 which we received, making a total net profit of £435,100 out of a total receipt of £1,204,260. If, therefore, we had only received an average rate of  $\frac{1}{2}$  d. per ton per mile, which was the average rate of 1876—and a low rate—for working our freight traffic, our proportion of working expenses would have been only 64 per cent. of the gross receipts. In like manner, if we had received the rate of 1873, which was 1.44 cents per ton per mile, then our net profit for the half-year would have been about £900,000, and our proportion of working expenses would have been about 47 per cent. But even the additional £179,000 of net profit, which the very moderate average rate of  $\frac{1}{2}$  d. per ton per mile would have given us, would have sufficed to provide £30,000 for the balance of dividend on the First Preference Stock; £58,000, or  $2\frac{1}{4}$  per cent., for the half-year on the Second Preference Stock; and £89,000 as  $1\frac{1}{2}$  per cent. for the half-year on the Third Preference Stock. This, gentlemen, is the possibility before us without any further increase to our traffic, or to our means of accommodating it, if we can only, by the avoidance of competition, obtain the reasonable rate of  $\frac{1}{2}$  d. per ton per mile for our freight traffic, the lowest rate which, as I have said, we experienced before the year 1876. Comparisons have sometimes been made between our railway and the East Indian Railway, and it has frequently been stated that if we could only reduce our working expenses to the same percentage proportion as the working expenses on that railway we should at once become a prosperous company. To the superficial railway reformer, who does not go so far as to ascertain the rates of transport respectively obtained on the two lines and the other conditions involved, that is an undeniable proposition; but when we come to consider the difference of circumstances of the two lines, a fair comparison is by no means to our discredit. I find from the half-yearly report of the East Indian Railway Company, and from the address of their excellent chairman to his shareholders, that  $\frac{1}{2}$  d. per ton per mile was the average rate obtained for their freight traffic during the half-year, and that their fuel cost them 5s. 7d. per ton; while we received, as I have said, .90 cent, say  $\frac{1}{2}$  d. per ton per mile, and paid £1 1s. per ton for our fuel. You will thus observe that the East Indian Railway Company were carrying goods, not, as stated by their chairman, at rates which were almost absolutely without precedent, but at rates which were almost exactly double those which we received. Their average for the half-year was—let me repeat it—about  $\frac{1}{2}$  d., ours was about  $\frac{1}{2}$  d. per ton per mile. The number of ton-miles of freight which we moved during the half-year was 435,433,534, for which we received in round numbers £700,000. At the rate which was obtained on the East Indian Railway we should have received about £1,400,000 for doing the same work, and this extra £700,000 would all have been net profit; but we only require £179,000 extra to pay the dividends above stated on all our preference stocks, the balance, £521,000—say half a million of money—would have been available as



net profit, partly for increasing those dividends and the remainder for providing a handsome dividend on the ordinary stock of the company for the half-year. Our working expenses would have been reduced on the basis of such rates from 75 to 45 per cent.; and, further, if we had been working with similar advantages as regards fuel, to 40 per cent. for the half-year. The cost of fuel on the Grand Trunk Railway, reducing wood and coal to a common denomination, as I have said, is about one guinea per ton for coal, while the cost of coal on the East Indian Railway is between five and six shillings per ton; and, further, upward of 50 per cent. more fuel is required to do the same amount of work in extremely cold weather on the Grand Trunk Railway than on the East Indian Railway at the average temperature on that line. It is true that they are much below us as regards passenger fares. The average passenger fare on the East Indian Railway is given by Mr. Crawford as  $\frac{1}{4}$  d. per mile, whereas the average passenger fare on the Grand Trunk Railway was slightly in excess of 1 d. per mile. But the passengers are carried under very different circumstances. We are obliged, on the Grand Trunk Railway to provide Pullman cars and other luxuries for a comparatively small number of passengers, and we are only able to obtain an average of fifty-eight passengers per train; while the East Indian Company, being free from competition with other railways, and having a dense population to draw upon are able by limiting the number of trains, to increase the length of those that are run and pack them with an average of 244 passengers per train. Having regard to differences of country, climate, population, competition, and other circumstances, I unhesitatingly maintain that our management will not suffer in reputation from any impartial comparison of the working of the two companies. I do not wish to detract from the credit which attaches to Mr. Crawford, as chairman, and to his officers, for the success which they have achieved, and I rejoice to see them in their present prosperous condition; but the more carefully the conditions of the problem are studied, the more certainly the conclusion is reached that the executive officers of the Grand Trunk Company deserve at least as much credit for having, with much lower freight rates, and many adverse circumstances, earned the small dividend which we have been enabled to pay on our first preference stock, as the officers of the East Indian, or any other railway, who have, under happier conditions, earned for their proprietors more prosperous dividends. We should be most happy in many respects to change places with them. Their lines are laid in pleasant places, while we have a continuous struggle with adversity; from which, however, we do not propose to desist till we have merged into comparative sunshine. The next consideration to which these facts lead us is, whether there are any and what means of improving our own condition. Our prospects depend mainly on two elements. These are, first, the general prosperity of Canada and the United States; but secondly, and mainly, the absence of reckless and insane competition between the trunk lines. As regards the element of commercial prosperity, Canada and the States have of late years been in a most unfortunate condition. There were 1,728 failures in 1876, and 1,890 in 1877, for upward of £11,000,000 in the Dominion; with 17,964 failures in the States for the two years, for a total sum of £80,000,000. Immigration has fallen off; the timber trade has declined. The Canadian Finance Minister had occasion recently to lament in his budget speech that, whereas, a few years ago, with a total population of 3,600,000 souls, the country imported goods to the value of \$127,000,000, last year, with a probable population of 4,000,000, the value of the imports was only a little over \$94,000,000. It was satisfactory, however, to find that the tide had apparently in some degree turned, and that in the seven months ending February 10 last, there had been a slight increase as compared with the corresponding period of the preceding year. After four years of depression, it may be hoped that the prospects of the Dominion will, ere long, improve commercially and financially; that the imports will once more increase from \$23½ to which they had fallen, to \$35½ per head, at which they previously stood; that people will again have occasion to travel for business, and be able to travel for pleasure; and that these improvements will be the means of increasing, as they can hardly fail to do, the receipts and net profits of our railway. There appears to have been of late greater improvement in the neighboring American States than in Canada; but while we have been struggling through hard times, there has been a lamentable list of bankruptcies accumulating on the American railways. In addition to the thirty railways sold under foreclosure during 1876, fifty-four were similarly sold in 1877; and thus eighty-four railways, comprising altogether upward of 7,700 miles—or one-tenth of the railway system of the country, representing also a nominal investment of \$400,000,000, have been sold under foreclosure in the last two years. There are further forty-four railways, with an additional mileage of 5,500 miles, in regard to which proceedings are pending, and which are in the hands of receivers, and they represent a further capital of about \$500,000,000. These proceedings, therefore, in two years have been adopted in regard to about one-fifth of the railway capital of the country. Just as over-population in a country leads to famine and disease in times when, from want of rain or other circumstances, provisions become scarce and the means of providing for existence are wanting, so also the over-construction of railways in any country tends to financial famine and disaster, which is especially felt in times of commercial depression. The United States and Canada have both from similar causes been passing through a crisis of this description; and it has been aggravated in Canada in consequence of the action of the municipal bodies and corporations, and the Provincial Governments, who have assisted or constructed railways which will, for a long period, seriously embarrass them, not only by directly absorbing their resources and injuring their credit, but also by inflicting competition and damage on previously established railways, which it is to their interest as well as ours to place and retain in a prosperous condition. As regards competition between the different railways connecting the sources of traffic in the West with the Atlantic ports, you will remember the important meeting which was held, and which I attended, in New York, in the first week of last October. There was then a unanimous decision in favor of harmonious working, and the restoration of rates. If the intentions then so generally expressed had been carried out in good faith by all the contending parties for east-bound traffic, all the companies concerned would have realized much larger profits, and we should have been able to pay you much larger dividends. But unfortunately the letters from Canada from that time to this form a continual record of complaints, that the tariffs agreed upon from time to time have not been carried out, that rates have been cut, and contracts made for longer or shorter periods at lower rates, and that successive meetings and constant discussions have been unavailing to bring about a better state of things. You will, I am sure, approve of the course which our officers, acting under our instructions, have adopted. They have not originated any cutting of rates, they have done their utmost to maintain the tariff, and they have over and over again sacrificed traffic in order to do so. The complaints that they make are principally directed against one great company, which, for the sake of peace, and in the hope of future harmony, I shall not name,

and its allies. Mr. Fink, the Eastern, and Mr. Guilford, the Western, trunk line commissioner, have been most assiduous in their efforts to restore harmony and to prevent competition. Judging from the voluminous correspondence which has passed, it would appear that the principle obstacle in the way of a fair settlement of all these questions, has been a gentleman who stated openly that, 'As long as his wagons were not filled, he should continue to reduce rates.' If all were to act in this spirit, railway interest and bondholders might as well give up at once all hope of share or dividends; and so long as any one great railway system and its connections refuse or fail in practice to abide by terms of settlement jointly agreed upon or decided by arbitration for the common good, so long must all the other railway systems suffer in loss of profit on their business. No company can reap ultimate benefit from such proceedings. When one company begins the cutting of rates other companies are sure to follow, and all carry in the end about the same amount of traffic, divided pretty much in similar proportions, as when reasonable rates and reasonable facilities are honorably maintained. Our hope, and the hope of all other companies desiring under a fair apportionment of traffic to work at moderately reasonable profits, lies in the establishment of an authority to whose decision we may bow, to whom complaints of non-observance can be made, and in whose hands the power of compelling obedience and inflicting penalties shall be placed.

#### Account of the Erection of a Railway Bridge at Grand Rapids, Mich.\*

BY WILLARD S. POPE, C. E.

A bridge was recently built for the Detroit & Milwaukee Railroad across Grand River at the city of Grand Rapids, Michigan, some items connected with the erection of which may be of interest.

The original bridge, built several years since, was for a single track. The trusses were of timber, and they were supplemented by timber arches bolted thereto. There were 7 spans of 100 feet each. The trusses were about 20 ft. high, and about 16 ft. apart in the clear. The cross floor beams carrying the railroad track were placed on the lower chords, making what is technically called a through bridge. The piers were on a skew of about 8 feet in the width of the bridge.

These spans were replaced by an iron structure resting on the original piers. The end spans, however, were shortened by the building of new abutments, so that the bridge now consists of 2 shore spans of 60 ft. each, and 5 river spans of 100 ft. each, making a total length of about 620 feet of iron bridging. It was decided to raise the grade line about six feet. The new structure is therefore a deck bridge, the cross ties being placed on the upper chords. The style is of the kind known as plate girder, the 5 river spans of 100 ft. each being 10 ft. deep, and the 2 shore spans of 60 ft. each being 5 ft. deep. Each span consists of 2 girders placed 10 ft. apart between centres, with ample lateral bracing both horizontally and vertically. The flanges are uniformly 20 inches wide. The general construction is of the ordinary form peculiar to this style of structure. The girders are not continuous, each span being independent of its neighbors.

There were various reasons why it was undesirable to place false works in the river, and accordingly it was decided to use the old structure on which to erect the new. The girders were riveted up complete at the bridge works in Detroit, and transported bodily to the place of erection. The 100 ft. spans weighed about 40 tons, each single girder weighing about 20 tons. In transport one girder was placed upon three flat cars having bearings only on the two end ones, the intermediate car being used simply to fill up the space. The girder stood in a vertical position, being well braced to the car body by swivel rods at the point of bearing. Thus loaded they were transported over the railroad about 160 miles without difficulty, going around curves quite easily. The cars were carefully braced apart as well as shackled together, so that there was no slack or play in the couplings.

Having arrived at their destination, they were placed on the old bridge, each within the particular span which it was to supplant; one girder on each side close to the old trusses. The old bridge being about 16 feet wide in the clear, there was just room to allow trains to pass between the girders. Cross beams had been placed on the upper chords of the old trusses over the piers, from which each girder was lowered down off the cars by block and fall.

A suitable iron bail or strap had been built into each end of each girder, so that attachment could be readily made to the hoisting lines. The girders were placed on blocking over the piers, their lower flange being about six inches above the tops of the cross floor beams of the old spans, so that these carried nothing of their weight.

Matters were in this condition when the last train crossed the old bridge on the evening of Saturday, Oct. 27, 1877. The structure was then given up to the brigdemann, and the work was immediately commenced of replacing the old spans by the new. The railroad track being taken up, the cross floor beams and lower lateral system of the old spans were removed, and the girders were lowered down and hauled into position, and the work of attaching the lateral system was begun. They were lowered about five feet, and drawn toward each other so that when in position, they were ten feet apart between centres.

The arrangements for handling them were so complete, that they were very easily placed in exact position. The work was prosecuted continuously except when once interrupted for about three hours on Sunday night by a heavy wind storm; and was completed so that trains crossed the new bridge at about 7 o'clock Monday evening, Oct. 29.

Thus 7 spans of iron bridge, 6 of 100 feet each, and 2 of 60 feet each, with 40 feet of trestle at each end, making in all 700 lineal feet of bridging, had been erected in place; the grade raised about 6 feet; the earth work at the approach embankments at each end brought up to the new grade line, and the railroad track laid over the whole; all in about 45 working hours.

The bridge was built by the Detroit Bridge & Iron Works of Detroit, Mich. The engineer of the railroad company is Mr. George Masson of Detroit, who designed and personally superintended the work of putting the new structure in place.

DETROIT, November, 1877.

\*A paper read before the Civil Engineers' Club of the Northwest, Jan. 2, 1878.

—Mr. Robert Frazer, President of the Wilmington & Northern Railroad Company, died at his residence in Philadelphia, May 4. He was for several years President of the Camden & Atlantic, and in January, 1874, was chosen President of the Wilmington & Reading, which position he retained when the company was re-organized under its present name.

—Messrs. Wilson Brothers & Co., Engineers and Architects, of Philadelphia, have added to their business a department of mining engineering, which is under the charge of Mr. John F. Blandy, a competent and well-known mining engineer.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Meetings.

Meetings will be held as follows:  
Columbus, Chicago & Indiana Central, annual meeting, at the office in Columbus, O., June 5, at 11 a. m.  
Kentucky Central, annual meeting, at the office in Covington, Ky., May 28.  
Boston & New York Air Line, annual meeting, in Middletown, Conn., June 4, at 1 p. m.  
Connecticut Western, annual meeting, at the office in Hartford, Conn., May 21, at 10 a. m.  
Nashua & Lowell, annual meeting, at the office in Nashua, N. H., May 29, at 10 a. m.

#### Dividends.

Dividends have been declared as follows:  
Northern (New Hampshire)  $2\frac{1}{2}$  per cent., semi-annual, payable June 1.  
Catawissa (leased to Philadelphia & Reading),  $3\frac{1}{2}$  per cent., semi-annual, on the preferred stock, payable May 14.

#### Railroad Conventions.

The fifth annual meeting of the *Purchasing Agents' Association* will be held in New York, beginning Tuesday, May 21.

The twelfth annual meeting of the *Master Car-Builders' Association*, will be held at Niagara Falls, N. Y., beginning Wednesday, June 12.

The *Yardmasters' Mutual Benevolent Association* will hold its annual convention in Chicago, June 5.

#### Foreclosure Sales.

The *Lake Erie, Alliance & Wheeling* road was sold at Alliance, O., May 11, and bought in for \$36,000 for account of the Cleveland Rolling Mill Company, the chief creditor. The road is of 3 ft. gauge, and is in operation from Alliance, O., north to Braceville, 24 miles.

Future sales are announced as follows:

The *Port Royal Railroad* will be sold at Port Royal, S. C., June 6, under a decree of foreclosure granted by the United States Circuit Court. The terms of sale are one-third cash, the balance on one and two years' time, secured by a special mortgage on the road; of the one-third cash \$10,000 must be paid on the day of sale, \$90,000 in five days and the balance in ten days, but bonds and coupons may be taken at cash, except for an amount sufficient to pay the costs in the case. The road extends from Port Royal, S. C., to Augusta, Ga.

#### Mail Routes.

Mail service has been ordered on new railroads, or extensions of old roads, as follows:

Chicago, Clinton, Dubuque & Minnesota, new service ordered on the Volga Branch, from Turkey River to Wardena, Ia., 44 miles.

Grayville & Mattoon, new service ordered from Mattoon, Ill., to Parkersburg, 69.6 miles.

Southwest Pennsylvania Branch of Pennsylvania Railroad, service extended from Uniontown, Pa., to Olyphant Furnace, 4.6 miles.

Pekin, Lincoln & Decatur, service extended from Pekin, Ill., to Peoria, 9 miles, over the lately leased Peoria & Springfield road.

### ELECTIONS AND APPOINTMENTS.

*Atlantic & Pacific Telegraph*.—The new board has elected Gen. Thomas T. Eckert President; Hamilton McK. Twombly, Vice-President; A. B. Chandler, Secretary and Treasurer; Thomas T. Eckert, H. McK. Twombly, Dr. Norvin Green, E. D. Morgan, Augustus Schell, Wm. J. Syms, John H. Mortimer, Executive Committee.

*Baltimore & Hanover*.—At the annual meeting in Hampstead, Md., May 7, the following directors were chosen: Charles W. Slagle, W. H. Vickery, Wm. H. Hoffman, Baltimore; C. C. Wooden, Carroll County, Md.; A. W. Eichelberger, S. Keefer, L. F. Melzheimer, Hanover, Pa. The board re-elected Capt. A. W. Eichelberger, President; L. F. Melzheimer, Secretary; R. M. Wirt, Treasurer.

*Baltimore & Ohio & Chicago*.—Mr. M. L. Doherty has been chosen President, and A. D. Smith Secretary, in place of W. C. Quincy and M. C. Winstanley, resigned. The road is leased to the Baltimore & Ohio.

*Breakwater & Frankford*.—At the recent annual meeting in Georgetown, Del., the following officers were chosen: President, Charles C. Stockley; Secretary, Benjamin Burton; Treasurer, Dr. David Houstain.

*Central, of Iowa*.—Mr. H. L. Morrill, the new Receiver, will act as Superintendent, in place of J. B. Johnson, resigned. Mr. Joseph Robinson is appointed Auditor and Cashier, in place of Henry Lawrence, resigned.

*Chartiers*.—At the annual meeting in Philadelphia, May 6, the following were chosen: President, George B. Roberts; directors, Josiah Bacon, Alexander Biddle, J. N. DuBarry, Strickland Kneass, S. M. Felton, Wistar Morris; Secretary and Treasurer, James R. McClure. The road is leased to the Pittsburgh, Cincinnati & St. Louis.

*Cheshire*.—At the annual meeting in Keene, N. H., May 8, the following directors were chosen: Edward C. Thayer, Keene, N. H.; James H. Williams, Bellows Falls, Vt.; Ephraim Murdock, Jr., Winchendon, Mass.; Wm. A. Russell, Lawrence, Mass.; Samuel Gould, John B. Meer, George F. Williams, Boston.

*Chicago, Burlington & Quincy*.—The report of the resignation of President Robert Harris and the election in his place of J. M. Forbes, of Boston, has been officially denied. No change so far has been made.

*Delaware & Hudson Canal*.—At the annual meeting in New York, May 14, the old board was re-elected as follows: Abiel A. Low, Robert Lenox Kennedy, James M. Halstead, Legrand B. Cannon, George Cabot Ward, James Roosevelt, James B. Taylor, John Jacob Astor, Levi P. Morton, J. Pierpont Morgan, Robert S. Hone, New York; Thomas Cornell, Kingston, N. Y.; Thomas Dickson, Scranton, Pa. The board re-elected Thomas Dickson, President; Robert M. Olyphant, Assistant President; George L. Haight, Secretary; James C. Hartt, Treasurer.

*Elizabeth, Lexington & Big Sandy*.—The Kentucky board of directors met in Lexington, May 11 and elected Thomas Bradley President, and Capt. Woodruff Secretary.

*Galena & Southern Wisconsin*.—Mr. H. Crabtree has been appointed Superintendent, and will have his office at Galena, Ill. Mr. Crabtree has been for 13 years in the Illinois Central bridge department, part of the time in charge of a bridge gang, and for two years has had charge of the bridge and carpenter work on the Gilman, Clinton & Springfield.

*Georgia*.—At the annual convention in Augusta, Ga., May



10, the opposition was successful after a two days' fight, and Gen. E. P. Alexander was chosen President in place of Hon. John P. King. The following directors were elected: Josiah H. Sibley, J. W. Davis, Stephen Thomas, John Davidson, C. H. Phinizy, H. D. McDaniel, N. L. Hutchins, H. H. Hickman, J. A. Billups, Wm. M. Reese, S. M. Hill, Geo. T. Jackson, John H. James, Geo. Hillyer, M. P. Stovall, J. S. Hamilton. The new directors are N. L. Hutchins, H. B. McDaniel and H. H. Hickman, who succeed Colonel E. W. Cole, David E. Butler and W. W. Clark.

Col. S. K. Johnson was reelected Superintendent. Gen. Alexander, the new President, is General Manager of the Western Railroad of Alabama, and has made himself already an excellent reputation.

At the close of the meeting Mr. King was unanimously elected Honorary President for life.

**Grand Trunk.**—At the half-yearly meeting in London, Eng., April 29, the three directors whose terms then expired were reelected, as follows: Hon. James Ferrier, Montreal; Sir Charles Young, London; Robert Young, Glasgow, Scotland.

**Hamilton & Northwestern.**—At the annual meeting in Hamilton, Ont., May 7, the following directors were chosen: John Stuart, E. Gurney, W. Hendrie, John Proctor, James Turner, Wm. Copp, P. W. Dayfoot, M. Leggett. The board reelected John Stuart, President; Edward Gurney, Vice-President.

**Houston & Texas Central.**—At the annual meeting in Houston, Texas, May 5, the following directors were chosen: Charles Morgan, John J. Cisco, Charles A. Whitney, A. C. Hutchinson, Charles Fowler, G. Jordan, A. Groesbeck, E. W. Cave, A. S. Richardson. The board elected Charles A. Whitney President; G. Jordan, Vice-President and General Manager; A. S. Richardson, Secretary; E. W. Cave, Treasurer; G. Jordan, Charles Fowler, E. W. Cave, A. S. Richardson, Executive Committee. Mr. Morgan has since died.

**Kansas City, Burlington & Santa Fe.**—Mr. James Houston has been appointed Superintendent, with office in Burlington, Kansas. He was recently Chief Clerk in the Leavenworth, Lawrence & Galveston general freight office.

**Lafayette, Bloomington & Mississippi.**—At the annual meeting in Bloomington, Ill., May 9, C. R. Cummings, J. H. Collins and J. H. Cheney were chosen directors. The board elected C. R. Cummings, President; J. H. Cheney, Vice-President and Treasurer; John Collins, Secretary.

**Little Rock & Fort Smith.**—At the annual meeting in Little Rock, Ark., April 26, the following directors were chosen: S. F. Clark, Dudley E. Jones, A. W. Gay, Little Rock, Ark.; Jesse Turner, Van Buren, Ark.; W. M. Fishback, Fort Smith, Ark.; Elisha Atkins, J. H. Converse, T. H. Perkins, F. M. Weld, Boston. The board elected J. H. Converse, President; Jesse Turner, Vice-President; J. W. Gay, Secretary; H. B. Wilbur, Treasurer.

**Mahoning Coal.**—Mr. D. P. Eels has been reelected President and L. C. Higgins Secretary and Treasurer. The road is leased to the Lake Shore & Michigan Southern.

**New York Stock Exchange.**—At the annual election, held May 13, there was much excitement, and a number of tickets were in the field. The following is the ticket elected: President, Brayton Jones; Chairman, James Mitchell; Vice-Chairman, Wm. McClure; Treasurer, D. C. Hays; Secretary, B. Ogden White; Trustee of the Gratiuity Fund, R. M. Hartshorne; Governing Committee, to serve for four years, Henry Meigs, J. W. Kilborth, J. J. Higginson, S. J. Harriot, T. B. Atkins, Howard Lapsley, A. Wolff, Jr., T. S. Ferry, A. B. Baylis and C. S. Day; to serve two years, Donald Mackay, H. H. Hollister, A. M. Cahoon, Simon J. Drake, D. B. Van Emburgh; to serve one year, E. T. Bogart.

**Pensacola.**—This company was fully organized at Pensacola, Fla., May 4, by the election of the following directors: D. F. Sullivan, M. H. Sullivan, R. L. Campbell, W. D. Chipley, G. A. Stanley. Mr. D. F. Sullivan was chosen President and W. D. Chipley, General Manager.

**Pennsylvania & Erie Coal & Railroad Co.**—At the annual meeting in New York, May 14, the following directors were chosen: H. G. Stebbins, E. S. Bowen, E. M. Clymer, Dr. C. R. Early, R. Saltonstall. The company is controlled by the Erie.

**Pittsburgh Southern.**—At a meeting of the board, held May 7, Josiah Roemer was chosen Vice-President. M. K. Salisbury was chosen Secretary and Treasurer, in place of J. H. Miller, who is appointed General Freight and Passenger Agent.

**St. Louis & San Francisco.**—The following circular is dated May 6:

"It being deemed expedient to separate the general freight and passenger departments of this company, Mr. D. Wishart, the present General Freight and Passenger Agent, will, on and after May 8, 1878, relinquish the duties of General Freight Agent and continue as General Passenger Agent, to whom all communications regarding passenger or ticket business should be addressed. Mr. T. E. Cassidy has been appointed General Freight Agent, to take effect May 8, 1878. All communications pertaining to the freight business should be addressed to him."

**Seaboard & Roanoke.**—At the adjourned annual meeting in Portsmouth, Va., May 7, the old board was reelected, as follows: President, John M. Robinson, Baltimore; directors, D. A. Barnes, Raleigh, N. C.; R. Dickson, Norfolk, Va.; R. C. Hoffman, Thomas Kelsa, Baltimore; Nulbro Frazier, Moncure Robinson, Philadelphia.

**Shamokin Valley & Pottsville.**—At the annual meeting in Philadelphia, May 6, the following were chosen: President, Thomas A. Scott; directors, A. J. Cassatt, J. N. DuBarry, Jacob P. Jones, Wistar Morris, G. B. Roberts, Edmund Smith. The road is leased to the Northern Central.

**Southwestern Railway Association.**—The officers of this successor to the old Southwestern Rate Association are: Chairman, J. C. McMullin, Chicago & Alton; General Commissioner, J. W. Midegley, Chicago; General Western Agents, John Crampton and H. H. Courtright.

**Springfield, Jackson & Pomeroy.**—Mr. Wm. Thornburg is appointed Superintendent. He has been for a long time on the Cleveland, Columbus, Cincinnati & Indianapolis.

**Springfield & Northwestern.**—The purchasers of this road at foreclosure sale have organized a new company by electing the following directors: John Williams, John T. Stuart, George N. Black, A. Orendorff, Bluford Wilson, George Pasfield, A. Iselin, A. F. Stebbins, Wm. B. Stephens.

**Utica, Ithaca & Elmira.**—The new company of this name, organized by the purchasers of the road at the recent sale, has the following officers: President, G. James Rice; Vice-President and General Manager, Joseph Rodbourne; Secretary, David S. Greenough; Treasurer, M. W. Serat.

**Vineland.**—At the annual meeting in Camden, N. J., May 7, the following directors were chosen: Jay Gould, Thomas

J. Sheridan, Thomas G. Rigney, Louis H. Taylor, James P. Mead, Joshua Comly, J. H. Bingham. The board elected Jay Gould President; J. H. Bingham, Secretary and Treasurer. The road is worked as part of the New Jersey Southern.

**Wilmington & Northern.**—Henry A. Du Pont and M. Dixon have been chosen directors in place of Robert Frazer and Lamoth Du Pont, both deceased. Mr. Edward G. Buckley has been chosen President *pro tem.* in place of Mr. Frazer.

### PERSONAL.

—Mr. P. Stevenson has resigned his position as General Freight Agent of the Grand Trunk Railway.

—Mr. Charles C. Case died in Watertown, N. Y., May 8, after a long illness. He entered the employ of the Rome, Watertown & Ogdensburg road as clerk in 1856, and, after serving in several subordinate positions, was made General Freight Agent in 1864. He held that office until Dec. 1, 1873, when he resigned on account of failing health. He was Acting Superintendent of the road for a short time in 1868.

—Mr. Arthur W. Bell, of the well-known locomotive firm of Porter, Bell & Co., of Pittsburgh, died May 2. He leaves many friends in Pittsburgh and elsewhere.

—Mr. C. R. Griggs, of New York, has gone into bankruptcy with liabilities of \$418,210, in addition to his share in some \$484,000 debts of the contracting firm of Griggs, Smith & Co. Most of the debts were incurred in building the Indianapolis, Bloomington & Western road, of which he was the first President.

—Mr. James L. Ford, for several years past connected with the publishing department of the Railroad Gazette, has left it to take charge of the Pittsfield Sun. His residence and address will be at Pittsfield, Mass.

—The defeat of Hon. John P. King, at the Georgia Railroad election last week, removes from active service one of the most noted of Southern railroad managers. Mr. King has been in public life nearly fifty years, and represented Georgia in the United States Senate as long ago as 1834, and for thirty-six years—more than a generation—he has managed the Georgia Railroad. Old as he is, he did not retire willingly; he made a stubborn fight for his position, but was beaten at last by a majority of 4,081 out of a total of 37,491 votes cast. No one has charged him with any want of devotion to his road, but errors of judgment were brought up by his opponents, and the passing of several dividends had brought about a strong feeling of dissatisfaction, especially among the smaller stockholders, of whom there are many. His opponents were active and commented unsparingly upon the mistakes of the past management, chief among them the indorsement of the Port Royal bonds and the building of the Macon & Augusta road. They brought every influence to bear, and succeeded finally by a greater majority than they expected, in an unusually full meeting. After the election a feeling of pity and respect for the defeated President seems to have prevailed, and it was unanimously voted, in consideration of his long services, to make him Honorary President of the company for life.

General Alexander, the new President, is comparatively a young man, being now in his 43d year. He is a graduate of West Point, and served for a time in the United States Engineer Corps. At the breaking out of the war, he joined the Confederate Army and served through the war, at its close being Chief of Artillery under General Lee. After a short service as Professor in the University of South Carolina, he was chosen Superintendent of the Charlotte, Columbia & Augusta road. From this he went to the Savannah & Memphis for a time, and for several years past he has been filling a somewhat difficult position as General Manager of the Western Railroad of Alabama under the joint ownership of the Georgia and the Central companies.

### TRAFFIC AND EARNINGS.

#### Grain Movement.

San Francisco wheat exports for April were seven cargoes, 341,770 bushels in all. For the ten months of the California crop year ending April 30 the exports were 5,709,955 bushels, or about one-third of the previous year's shipments.

Receipts and shipments for the week ending May 4 were, in bushels:

	1878.	1877.	Increase.	P. c.
Northwestern receipts.	4,834,507	3,390,193	1,438,314	42.3
Shipments.	4,591,346	4,521,713	69,633	1.5
Atlantic receipts.	3,990,700	2,196,090	1,794,610	81.5

Of the Northwestern shipments, 23 per cent. were by rail this year, against 29% in 1877, 46% in 1876, 42% in 1875, and 31 per cent. in 1874; in all of which years navigation was open.

Of the receipts at Atlantic ports, 55.7 per cent. arrived at New York, 16.8 at Philadelphia, 14.4 at Baltimore, 6.2 at New Orleans, 5.4 at Boston, 1.4 at Portland, and 0.1 at Montreal.

Receipts of grain for the week ending May 13 were 2,769,249 bushels at New York, 633,621 at Baltimore, 661,300 at Philadelphia and 733,150 at Boston, or 4,797,320 bushels in all, 58 per cent. of which was received at New York. Of the New York receipts only 701,607 bushels, or 25% per cent., were by rail. For the same week 3,800,851 bushels were received at Buffalo, 16 per cent. of it by rail, and the Buffalo shipments were 2,805,605 bushels, 27% per cent. of which was by rail.

#### Coal Movement.

The anthracite tonnage for the week ending May 4 was: 1878, 315,085; 1877, 463,041; decrease, 147,956 tons, or 32 per cent.

Contracts are reported for a year's supply, about 50,000 tons, for the North German Lloyd's steamship line between New York and Bremen, and for a year's supply, 65,000 tons, of Clearfield for the Hamburg-New York line.

The tonnage actually passed over the Pennsylvania & New York road for the five months of its fiscal year from Dec. 1 to April 27 was:

	1878.	1877.	Decrease.	P. c.
Anthracite.	211,371	284,365	73,014	25.7
Bituminous.	132,359	152,453	20,094	13.2
Total.	343,730	436,818	93,108	20.1

The coal tonnage of the Pennsylvania Railroad for the four months ending April 30 was:

	1878.	1877.	Inc. or Dec.	P. c.
Anthracite.	187,311	198,479	D. 11,168	5.6
Semi-bituminous.	494,939	435,443	I. 59,496	13.7
Bituminous.	515,102	509,169	I. 5,933	1.2
Coke.	330,794	285,463	I. 45,331	12.0
Total.	1,528,146	1,438,554	I. 89,592	6.2

The April tonnage was greater than that of the same month last year.

Coal shipments from Seattle, Wash. Ter., for April were 5,276 tons, and for the four months ending April 30, they

were 24,184 tons. The April shipments were the smallest for many months.

### Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:	1877.	1876.	Inc. or Dec.	P. c.
Delaware Western.	45,310	.....	.....	.....
Expenses.	35,315	.....	.....	.....
Net earnings.	\$9,995	.....	.....	.....
Earnings per mile.	2,266	.....	.....	.....
P. c. of expenses.	77.95	.....	.....	.....
Detroit & Bay City.	361,632	375,707	D.	14,075 3.7
Expenses.	264,350	260,187	I.	4,163 1.6
Net earnings.	\$97,282	\$115,520	D.	\$18,238 15.8
Earnings per mile.	3,288	3,415	D.	127 3.7
P. c. of expenses.	73.00	64.63	I.	8.46 13.1

Year ending March 31:	1877-78.	1876-77.	Inc. or Dec.	P. c.
Breakwater & Frankford.	\$16,789	.....	.....	.....
Expenses.	14,361	.....	.....	.....
Net earnings.	\$2,428	.....	.....	.....
Earnings per mile.	839	.....	.....	.....
P. c. of expenses.	85.48	.....	.....	.....

Four Months ending April 30:	1878.	1877.	Inc. or Dec.	P. c.
Burlington & Mo. River in Nebraska.	\$482,820	\$294,293	I.	\$188,527 64.1
Denver & Rio Grande.	260,419	180,582	I.	79,837 44.2
Ill. Cen. & Ill. lines.	1,600,477	1,418,350	I.	182,127 12.8
" Spring Div.	56,574	.....	.....	.....
" Iowa lines.	501,479	409,088	I.	92,391 22.6
Ind., Bloom. & West.	426,253	386,097	I.	40,156 10.1
Int. & Gt. Northern.	429,842	502,585	D.	72,743 14.5
Kansas Pacific.	926,487	845,841	I.	80,646 9.4
Missouri, Kansas & Texas.	841,489	941,503	D.	100,014 10.6
Missouri Pacific.	1,272,662	1,193,541	I.	79,121 6.6
St. L. Alton & T. H. Bellefonte line.	148,311	168,180	D.	19,869 11.8
St. Louis, Kan. City & Northern.	1,047,089	1,014,210	I.	32,879 3.2
St. Louis & San Francisco.	361,516	415,647	D.	54,131 13.0
St. Louis & South-eastern.	350,285	329,308	I.	20,977 6.4
Tol. Peoria & War.	424,816	333,482	I.	91,334 27.4
Wabash.	1,435,214	1,348,876	I.	86,338 6.4

Three months ending March 31:	1878.	1877.	Inc. or Dec.	P. c.
At. Miss. & Ohio.	\$389,577	\$379,849	I.	\$9,728 2.6
Net earnings.	115,232	.....	.....	.....
P. c. of expenses.	70.34	.....	.....	.....
Chicago & Alton.	958,557	1,022,109	D.	63,552 6.2
Net earnings.	390,484	366,740	I.	23,744 6.5
P. c. of expenses.	59.24	64.13	D.	4.84 7.6

Chl. Burlington & Quincy.	3,126,448	2,636,608	I.	489,780 18.6
Net earnings.	1,313,965	1,009,771	I.	304,194 30.1
P. c. of expenses.	57.98	61.70	D.	3.72 6.0
Clev. Mt. Vernon & Delaware.	88,081	81,571	I.	6,510 8.0
Net earnings.	18,448	11,907	I.	6,541 55.0
P. c. of expenses.	79.13	85.37	D.	6.24 7.3
Dakota Southern.	47,528	30,571	I.	16,957 55.4
Net earnings.	27,053	.....	.....	.....
P. c. of expenses.	43.10	.....	.....	.....
Kansas Pacific.	647,019	587,643	I.	59,376 10.1
Net earnings.	107,594	235,105	D.	127,511 15.4
P. c. of expenses.	69.51	60.30	I.	8.21 15.3
Louisville, Cin. & Lexington.	209,684	233,573	D.	23,889 10.2
Net earnings.	44,192	42,632	I.	1,560 3.7
P. c. of expenses.	78.81	81.60	D.	2.79 3.4
Louisville & Nashv.	1,350,281	1,297,795	I.	52,486 4.0
Net earnings.	520,216	479,690	I.	40,526 8.5
P. c. of expenses.	61.49	65.03	D.	3.54 5.8
Missouri, Kansas & Texas.	634,693	719,846	D.	85,153 11.4
Net earnings.	107,153	271,303	D.	164,150 60.5
P. c. of expenses.	83.08	62.30	I.	20.78 33.4
Nash., Chat. & St. L.	476,634	438,536	I.	38,098 8.5
Net earnings.	190,896	181,359	I.	9,537 5.3
P. c. of expenses.	59.95	58.59	I.	1.36 2.3
Paducah & Memphis.	52,623	45,003	I.	7,620 16.9
Net earnings.	14,387	8,404	I.	5,983 95.0
P. c. of expenses.	72.14	81.33	D.	9.19 11.3

Pittsburgh, Cin. & St. Louis.	793,637	.....	.....	.....
Net earnings.	337,185	.....	.....	.....
P. c. of expenses.	57.49	.....	.....	.....
St. L. & South.	1,061,637	1,060,387	D.	250 0.02
Net earnings.	447,769	492,803	D.	45,034 9.1
P. c. of expenses.	57.80	54.41	I.	3.39 6.2
St. Paul & Sioux City.	130,669	91,202	I.	39,467 43.3
Net earnings.	49,291	17,010	I.	32,281 189.9
P. c. of expenses.	62.12	81.53	D.	19.41 23.8
Sioux City & St. Paul.	87,621	52,391	I.	35,230 67.2
Net earnings.	27,870	6,623	I.	21,247 321.9
P. c. of expenses.	67.90	88.00	D.	20.10 22.8
Southern Minnesota.	178,767	104,494	I.	74,273 71.1
Net earnings.	100,850	35,385	I.	65,465 184.9
P. c. of expenses.	43.53	60.45	D.	16.92 34.5

Month of April:	1878.	1877.	Inc. or Dec.	P. c.
Burlington & Mo. River in Nebraska.	\$131,497	\$75,100	I.	\$56,397 75.1
Denver & Rio Grande.	80,927	49,323	I.	31,604 64.1
Ill. Cen. & Ill. lines.	391,196	328,550	I.	62,646 19.1
" Spring Div.	13,718	.....	.....	.....
" Iowa lines.	118,438	101,598	I.	16,840 16.6
Ind., Bloom. & West.	94,424	111,179	D.	16,755 15.1



10½d. to 6s. per quarter from New York and at 6s. from Baltimore.

#### East-Bound Freight Rates.

Chicago dispatches of May 15 report rates on grain to New York still at 18 or 20 cents, the companies nominally maintaining the 20-cent rate. Some cutting to other points is reported, and it is said that a good deal of grain for Philadelphia and Baltimore had been taken at 13 cents.

#### THE SCRAP HEAP.

##### Railroad Manufactures.

Snyder Brothers, of Williamsport, Pa., have recently furnished the Pennsylvania Railroad Company with a number of their patent air-tight man-holes and covers for oil tank cars. These covers are intended to prevent escape of oil in case a car is run off the track or upset, and are supplied with a safety valve to allow escape of gas, if necessary.

The Eclipse Wind Mill Co., of Beloit, Wis., is now equipping the water stations on the Scioto Valley and the Springfield, Jackson & Pomeroy roads. The company has 20 of its windmills in use on the Atchison, Topeka & Santa Fe, 16 on the Chicago & Northwestern and a large number on the Chicago, Milwaukee & St. Paul, the Chicago, Burlington & Quincy and nearly 40 other roads.

The National Locomotive Works of W. H. Bailey & Co., at Connellsville, Pa., recently delivered two narrow-gauge engines to the Minnesota Midland road.

The Pittsburgh, Fort Wayne & Chicago shops at Fort Wayne, Ind., are building three new switching engines. The car shops are building 50 new box cars for the Cleveland & Pittsburgh road.

The Ironton (O.) Era says of the blast furnaces in that neighborhood: "The Belfont Furnace will go on again Monday morning. Hecla Furnace will blow in about the 15th, for a blast of 2,500 tons. Lawrence is doing splendidly on car wheel iron. Monitor will blow in next week some time. The machine shops are doing very little. Lawrence Iron Works continues on full force. Ashland was a little sick early in the week, but is coming around again. Princess is doing better."

Erb & Hunsicker are preparing to start up their Maiden-creek Furnace, in Berks County, Pa., which has been idle for several years. It is a charcoal furnace.

The Tiffany Refrigerator Car Co. has now a number of cars in use by the Atlantic Coast Line's fruit and vegetable express carrying fruit, etc., from Florida, Georgia and South Carolina to New York and other Northern points. These cars have worked in a very satisfactory manner.

The Atlanta (Ga.) Rolling Mill has resumed work, after two or three stoppages and a good deal of difficulty with its employees.

The Schoener Rolling Mill, at Tamaqua, Pa., has started up on a large contract, after a stoppage of seven months.

The Missouri Car & Foundry Co., of St. Louis, has just finished 25 Tiffany refrigerator cars for the Anheuser-Brewing Co. and 10 circus cars for Cole & Co. It is now building 200 box cars for the Chicago & Alton and has contracted to build 200 box cars for the Missouri River, Fort Scott & Gulf, 100 for the Kansas City, St. Joseph & Council Bluffs, and 100 for the Receiver of the Chicago, Pekin & Southwestern. It has also four narrow-gauge passenger cars under way, and bids awaiting decision for several hundred more cars.

The Continuous Draw-Bar Co., of Cincinnati has just contracted with the Wabash Railway for draw-bars for all their cars, old and new, and with the Louisville & Nashville, St. Louis & San Francisco, Flint & Pere Marquette and other roads. It claims for this draw-bar that it is cheaper in the first instance and that it saves fully 33 per cent. in car repairs.

#### Notes

The only things that do not wear out in the Erie Railway cars, are the four Bibles with which some of the cars are provided.—*Paterson Press*.

There are thirty-one different styles of car heaters in use in the United States. But when you get right down to a general railroad eater there's nothing really equal to construction bonds and first mortgages.—*Burlington Hawkeye*.

##### The Hinkley Locomotive Works.

Mr. Henry C. Sherburne, Trustee under the agreement with the creditors, announces that these works resumed business May 13, and are prepared to supply locomotives of all sizes and designs, boilers, tanks, iron and brass castings as heretofore. Mr. H. L. Leach is Superintendent of the works.

The Trustee also announces that there are many duplicate tools on hand, for which there is no present use at the works (many of them having been replaced), and he is prepared to sell them at very low prices.

##### Railroad Velocipedes.

Mr. Harry Millholland, of the Cumberland & Pennsylvania road, has designed and built a velocipede which he uses on the tracks of that road. It is very light, has driving wheels four feet in diameter, and is worked by a lever. It is said to have made very good time over the road.

##### Steam Road Wagons in Wisconsin.

A commission consisting of two farmers and one engineer is to meet in Madison, Wis., June 10, to award a prize of \$10,000 voted by the Legislature of that State for the best practical steam road wagon. The test will be the hauling of a load over ordinary country roads at the rate of five miles an hour for a distance of not less than 200 miles. Several entries have already been made.

#### OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—This company seems to have beaten the Denver & Rio Grande at all points, having secured possession of the Raton Pass for the line southward and of the Grand Canon of the Arkansas for the line westward to the San Juan mines. Both were gained by the strategy and prompt action of General Manager Strong and his assistants and in both cases the Denver & Rio Grande people were taken completely by surprise when they found their chosen ground occupied.

On the extension west from Pueblo, Col., to Leadville in the San Juan region, the graders are already at work in the Grand Canon, and the line is located from Pueblo to South Arkansas. From that point to Leadville the line is being located and will soon be ready to put under contract.

The contracts let on the New Mexico Extension are reported as follows by the *Trinidad (Col.) Democrat*: "The work on the tunnel on the Raton Mountain, with approaches, was awarded to S. H. Mallory & Co., of Des Moines, Ia. One hundred and ten miles of tracklaying, from La Junta to Clifton, New Mexico, to Charles Smith & Co., of Mount Pleasant, Ia. Of the earthwork, etc., 22 miles was let to Charles Smith & Co.; 9 miles mountain division to Houston & Neely, of Chattanooga, Tenn.; 10 miles to Bloosh & Co., Topeka, Kan.; 16 miles to Wm. Moore, Pueblo; and 40 miles to DeGraff & Wallace, of Danbury, Conn. These contracts aggregate in value \$1,500,000, and provide for the completion of the road to Trinidad by Aug. 15; summit of tunnel on Raton Mountain, Nov. 1, and Clifton, New Mexico, Feb. 1. The 120 miles from Clifton to Las Vegas is now being

located, and contracts will be let for the work at an early day. Contracts have been made for 305,000 ties, and the Pueblo Rolling Mills have a contract for 1,000 tons of iron for the road. Thirty miles of 56-pound steel rails will be laid on the mountain division."

Atlantic & Great Western.—Mr. George Herring has begun suit in the Court of Common Pleas at Cleveland, O., against this company as principal and the Erie as guarantor, to recover principal and interest of some \$90,000 of the bonds known as Western Extension bonds, which were issued for the purpose of securing control of the Cleveland, Columbus, Cincinnati & Indianapolis. The suit is said to be brought chiefly for the purpose of enforcing the Erie guarantee.

Bradford & Foster Brook.—The Attorney General of Pennsylvania has decided that this road, which is a one-rail elevated road, on Stone's plan, is a narrow-gauge road within the meaning of the law, and will take no proceedings against it.

The road is now in operation and running regular trains from Bradford, Pa., to Derrick City, four miles.

Breakwater & Frankford.—The earnings of this road for the year ending with March were:

Freight.....	\$11,755.00
Passengers.....	3,925.75
Other sources.....	1,108.44
Total (\$839.46 per mile).....	\$16,789.19
Expenses (\$5.48 per cent.).....	14,360.80

Net earnings (\$121.42 per mile).....\$2,428.39

The road is 20 miles long, from Georgetown, Del., to Selbyville, and is worked as a branch of the Junction & Breakwater, both being controlled by the Old Dominion Steamship Company.

Burlington & Missouri River in Nebraska.—This company has issued a circular to holders of its first-mortgage bonds asking them to exchange their bonds for new 6 per cent. bonds to be issued under a consolidated mortgage. To those making the exchange a premium of 20 per cent. is offered, that is \$1,200 in new bonds will be given for each old \$1,000 bond. The old bonds bear 8 per cent. interest.

The Land Department reports that the sales for the four months ending April 30 this year amounted to \$971,217, against \$55,417 for the same period in 1877.

Canadian Pacific.—The formal opening of the first completed section of the main line took place May 10. The section is 50 miles long, from Prince Arthur's Landing, on the north shore of Lake Superior, to Kaministiquia.

Central, of New Jersey.—It is stated that the assets received to the plan of adjustment up to May 15, when the books were closed, were as follows: Stock, \$13,739,000; consolidated bonds, \$15,278,000; Lehigh & Wilkes-Barre Coal Company bonds, \$4,400,000; American Dock & Improvement Company bonds, \$2,071,000. Some large stockholders are in correspondence with the Receiver, and will probably come in, if a short delay is given.

Cheshire.—At the annual meeting in Keene, N. H., May 8, the stockholders voted to authorize the issue of \$586,000 new 6 per cent. bonds, having 20 years to run, the proceeds of which are to be used exclusively to meet the payment of a like amount of bonds maturing in 1880.

Chicago & Northwestern.—The New York *Tribune* gives the following as a list of those whose names appeared on the transfer books when they were closed as the holders of 1,000 or more shares, either common or preferred, of the company's stock:

Ames, J. L., Boston.....	1,000	Morgan, D. P.,.....	11,000
Belden, Williams & Co.,.....	26,100	Muir, Robert, Montreal.....	1,800
Blake, S. C.,.....	2,000	Musgrave, T. B.,.....	1,000
Clark, F. L.,.....	2,000	Osborn, C. J. & Co.,.....	19,700
Colby, Robert.....	1,000	Osborn, C. J.,.....	1,000
Crouse, J., Syracuse.....	1,500	Parsons, Levi.....	2,800
Curry, William, Key.....	Porter, H. H., Chicago.....	2,500	
West.....	7,000	Scott, W. L., Erie.....	2,000
Dillon, Sidney.....	4,000	Scranton & Willard.....	1,000
Downs, David.....	1,500	Simpson, M. H.,.....	1,000
Dunne, W. H.,.....	1,000	Smith, P. H., Chicago.....	12,600
Eames & Moore.....	2,400	Smithers & Watson.....	1,000
Eames, M. R., Buffalo.....	1,400	Sikes, M. L., Jr.,.....	3,049
Glendinning, Davis & Co.,.....	4,150	Taylor, E. C.,.....	1,000
Gould, Jay.....	29,100	Taylor, W. B. & Co.,.....	1,000
Greene, J. F.,.....	1,000	Trowbridge, C. J.,.....	1,000
Hance, J. A.,.....	1,200	Van Schaick & Co.,.....	1,000
Hartshorne, J. M. & Bro.,.....	11,000	Vermilye & Co.,.....	1,900
Hatch, Rufus.....	1,000	Washburne, R. E.,.....	2,100
Hatch, Rufus & Co.,.....	800	Weston & DeBillier.....	1,100
Heath, William & Co.,.....	1,000	Whitehouse & Co.,.....	1,300
Hit, administrator Am-sterdam.....	57,555	Wood, George.....	2,000
Horton, H. L. & Co.,.....	5,000	Wornden & Leverich.....	1,500
Johnson, Davis & Co.,.....	3,400	Work, Frank.....	11,000
Jones, David.....	5,500	Work, John.....	3,600
Kennedy, H. & Co.,.....	28,100	Work, Strong & Co.,.....	6,950
Knickerbocker, H.,.....	1,500	Workman, H. & Co., and	
Latham, Alexander & Co.,.....	2,000	others, Belfast.....	3,396
Lawrence, T. N.,.....	1,000	Worth, P. H.,.....	1,000

Holders of certain classes of the bonds of this company have the privilege of voting.

Cincinnati Southern.—Notice is given that the trustees will receive sealed proposals until noon of July 18, for completing and leasing this road. Copies of the form of contract and lease, containing the conditions on which the road will be let, blank forms of proposals and copies of the report of the principal engineer on the condition of the road, and such other information as may be desired, can be had at the office of the trustees. Proposals may be directed to the Board of Trustees of the Cincinnati Southern Railway, No. 70 West Third street, Cincinnati.

Cleveland & Youngstown.—This company has filed articles of incorporation in Ohio for a line from Youngstown westward to Ravenna, about 35 miles. The capital stock is to be \$300,000.

Delaware Western.—The earnings of this road for 1877 were as follows:

Gross earnings (\$2,206 per mile).....	\$45,310.30
Expenses (77.95 per cent.).....	35,314.68

Net earnings (\$409 per mile).....\$9,995.62

For the first quarter of 1878 the earnings were \$9,943.35; net earnings, \$2,076.94. The expenses were increased by repairs of bridges damaged by freshets. Some steel rails were laid and a 60-ton track scale put up in Wilmington. The net earnings for 1876 and 1877 were used in the purchase of property for a freight depot and yard in Wilmington, and the track leading to the new property, the whole amount expended for these being \$19,127.27.

Detroit & Bay City.—The grading of the branch from Vassar, Mich., northeast up Cass River to Caro, is nearly finished, and only some small bridges remain to be built. The iron was laid at latest accounts for five miles from Vassar, leaving about eight miles to be laid to reach Caro.

Great Western of Canada.—At the half-yearly meeting in London, April 30, the stockholders passed resolutions authorizing the board to complete the purchase of the Galt & Guelph road, and also to lease the Detroit & Milwaukee road, and to carry out the agreement for the reorganization

of that company. There was a sharp debate on these resolutions and some criticism on the company's policy in acquiring leased lines which were a constant charge upon its revenue, but only five votes were cast against their passage on the final vote.

Illinois Central.—This company reports that during the month of April 599.10 acres of land were sold for \$4,259.50. The cash collected on land contracts was \$5,719.36.

The traffic on the main line in Illinois (707 miles) was \$391,196, against \$328,959.18 in April, 1877—an increase of \$62,236.82, or 18.9 per cent. There was also an increase on the Iowa Division of \$16,840.48, making the gain on the entire line for the month, \$79,077.30. In addition to the above the Springfield Division earned in April (as estimated) \$13,718.

Indianapolis, Bloomington & Western.—There was a little trouble at Peoria last week, the Pekin, Lincoln & Decatur Company, which lately leased the Peoria & Springfield road, over which the trains of this road run from Pekin to Peoria, having broken the connection on account of the non-payment of a claim of \$991 for back rent. The trains of the Indianapolis, Bloomington & Western were prevented from entering or leaving Peoria, although one train was run through on the Peoria, Pekin & Jacksonville track. Finally, to prevent further detention, Receiver Wright agreed to pay the claim, but without acknowledging its justice. Trains are now running regularly to Peoria as usual.

Iowa Railroad Commission.—The first complaint made against a railroad company under the new Iowa law is made by another company. The Keokuk & Des Moines Company has complained to the Commissioners that the Des Moines & Fort Dodge charges 10 cents a mile more for hauling its cars than for similar services performed for the Chicago, Rock Island & Pacific Railroad Company. The result is that the latter corporation has a monopoly of the business of the Fort Dodge route. The Commissioners have notified the Des Moines & Fort Dodge that the complaint has been made, and it is required to make an answer thereto.

Kansas Pacific.—The *Commercial and Financial Chronicle* of May 11 says: "The arrangement with Messrs. Jay Gould, Sidney Dillon and others, representing the Union Pacific interests, is said to be substantially as follows: 1. There are to be issued \$8,000,000 of 5 per cent. gold bonds secured by mortgage on the western part of the road, known as the Denver Extension, and guaranteed by the Union Pacific Company. These are to be exchanged for the present Denver Extension mortgage bonds (\$6,500,000) with all overdue interests, making about \$1,200 of the new for each \$1,000 of the principal of the old bonds; the balance of the new bonds not thus used are to be sold and the proceeds applied to the payment of the scrip on the eastern mortgage bonds, the 6s of February and August and June and December. 2. New stock is to be issued to the amount of \$5,000,000, of which \$1,000,000 is to be given for a like amount of the funded mortgage bonds of 1876. The "non-subrogated" income bonds (a small amount) are to be offered 50 per cent. in new stock, the land grant second mortgage bonds 50 per cent. in new stock, income bonds 30 per cent. in new stock, and old stock 12½ per cent. in new stock. With matters thus adjusted, it is estimated that the Kansas Pacific receipts would pay all annual charges, with a yearly surplus equal to 10 per cent. on the new stock."

Lake Huron & Southwestern.—The contractors for the grading are now busy on this lumber road, and a large force is at work. The section now under construction is 22 miles long, from Tawas City, Mich., on Lake Huron, west by south to town 21 north in range 4 east. It is intended, after a time, to extend the road 15 miles further to Summit, on the Jackson, Lansing & Saginaw. Several saw mills are being put up on the line of the road.

Lehigh & Eastern.—A new movement is reported in the affairs of this projected road, and Contractor Williams offers to begin work if \$500,000 can be raised along the line in cash subscriptions. The line of the road is from Hazleton, Pa., over the Pocono Mountain to the Delaware and up that river to Port Jervis, N. Y., about 100 miles in all.

Louisville & Nashville.—This company is developing a considerable business in forwarding early fruits and vegetables from Tennessee to the Louisville and Cincinnati markets. The business is this year large enough to require a special train, which is run through on fast time from Nashville. The shipments from Nashville alone have been from 30 to 45 tons a day, principally of strawberries, peas and beans.

Macon & Brunswick.—This road is reported as doing better than ever before. The net earnings since Jan. 1 have been sufficient to buy a new engine and two passenger cars and new rails for eight miles of road, and leave a surplus of \$20,000 to be paid into the State treasury.

Marietta & Cincinnati.—At a recent meeting of bondholders in Baltimore, a report was presented by a committee appointed at a previous meeting, with a communication from the Receiver. The report of the committee recommended that proceedings be begun to foreclose the prior mortgages, the Receiver having been appointed in proceedings begun under the fourth mortgage. The report was adopted, and a new committee appointed to carry out its recommendations and make arrangements to begin the foreclosure suits.

Mobile & Ohio.—In Washington, May 13, the United States Supreme Court announced its decision on the appeal from the decision of the Circuit Court in the matter of the coupons paid by Duncan and others for the company in 1874. The decision of the Circuit Court is affirmed, the Supreme Court holding that the deed of trust executed by the Mobile & Ohio Company in 1853 secured not only the bonds therein described, but also the interest coupons which fell due in May and November, 1874, and are now held by Duncan and others. The Court holds that, when they furnished the money which the former owners of the coupons received for them, they did not intend to pay them in such a sense as to relieve the railroad company from its obligations, and that certainly there was no intention to extinguish the coupons.

The holders of these coupons, therefore, will come in with an equal lien with the holders of the other unpaid coupons on the first-mortgage bonds. The decision was by a bare majority of the Court, Justices Clifford, Swayne, Miller and Harlan dissenting.

Montreal, Portland & Boston.—This company is now in a new trouble, the Central Vermont resisting an attempt to make a crossing over its track near West Farnham, P. Q., in order to complete a connection with the Southern and the Passumpsic roads. The crossing was put down in spite of a temporary injunction, and the Passumpsic Company has taken possession of the road from West Farnham to Chambly. From Chambly to St. Lambert the road is held by the Grand Trunk, which has been working it provisionally for some months.

Morgan's Louisiana & Texas.—The New Orleans *Times* says: "In the year 1877 the Legislature passed an act granting certain franchises to the late Charles Morgan's



Louisiana & Texas Railroad and Steamship Company, with a view to securing rail communication with Texas. This act was accepted by Mr. Morgan two months ago, and under its terms he organized a mammoth corporation to which he transferred his Louisiana and Texas interests. Forty miles of steel rails, deliverable in August, at Algiers, have been purchased for cash, and the road from Morgan City to Vermillionville, it is said, will be completed under the arrangement.

"Mr. E. D. Morgan, the proprietor of the Houston & Orange road, is pledged to close the gap between Orange and Lake Charles; the estate of Charles Morgan will build the remainder, and the Mobile Company will close the gap between Donaldsonville and Vermillionville. His most intimate friends assert that rail communication with Texas has been a pet scheme of Mr. Morgan for many years and that it was not until recently that plans had arranged themselves to admit of such a consummation.

"A carefully prepared article which appeared in the Times a number of years ago contained a statement based upon accurate data, that Mr. Morgan gave constant employment to five thousand men. Since then this number must have been considerably increased. The owner from first to last of one hundred and seven vessels, steam and sail, and the employer within sixty years of many thousands, there was probably never one during this period of more than a lifetime who treated his subordinates with more uniform courtesy, or watched their interests more scrupulously. To be employed by Charles Morgan and to perform one's duty was tantamount to remunerative occupation for life, with as much certainty of advancement as is accorded in any of the other avocations. Men who have grown gray in his service have rarely had occasion to regret the association, and scores can date the beginning of true prosperity to this connection. It is believed that his representatives will go on in the work to which he has devoted a life, and that the name of Morgan will become identified with trade in Texas very soon by both land and water."

**New Orleans Pacific.**—The first issue of the \$2,000,000 Louisiana State bonds in aid of this road is to be \$250,000 for the work already done. Subsequent issues will be at the rate of \$10,000 per mile for each section of 10 miles of completed road. The company deposits with the State Treasurer \$2,500,000 of its own first-mortgage bonds as security. It is said that the company will not sell the State bonds, but will deposit them in trust as additional security for its first-mortgage bonds, of which \$5,000,000 will be issued, one-half for deposit with the State as required by the law, and the rest to be sold to complete the road. Work on the line is to be pushed as fast as possible.

**New York Central & Hudson River.**—A number of passenger conductors on this road have lately been discharged, among them some of the oldest on the road. No cause for their discharge has been given and, of course, there are many reports about it. More dismissals are expected.

**New York, Lake Erie & Western.**—At a meeting of the directors held April 27 in New York the following resolutions were adopted by a unanimous vote:

*Resolved.* That this board tenders to Hon. Hugh J. Jewett its gratitude and sincere thanks for his able, wise and energetic administration of the property and affairs of the Erie Railway Company, both as President and Receiver.

*Resolved.* That we extend to him the emphatic assurance of our entire respect and confidence, and we denounce as utterly false, malicious and defamatory the various loose, vague, and general charges of mismanagement and misconduct that have been brought against him in the course of the litigation in opposition to the scheme of reconstruction, and in various newspapers published in London.

**Ohio & Mississippi.**—Receiver King reports for April, as follows:

Balance, April 1	\$22,010.44
Receipts	336,214.39
Total	\$358,224.83
Vouchers prior to Nov. 18, 1876	\$8,828.94
Vouchers and pay-rolls subsequent to Nov. 18, 1876	311,089.50
	320,518.44

Balance, May 1.....\$37,706.39  
The receipts were \$15,695.95 greater than the payments.

**Pacific Railroad Legislation.**—Senator Thurman has introduced a bill supplementary to the Pacific Railroad sinking fund act approved by the President, May 7. The object of its framers is to carry out and enforce strictly the provisions of the latter measure and render it impossible for the companies to escape the fulfillment of the obligations imposed upon them without incurring the severest penalties. The principal features of the bill are the following: First, a new bureau, with a full complement of clerks, is added to the Interior Department, over which there shall be an official, to be appointed by the Secretary of the Interior, to be known as the Auditor of Pacific Railroad Accounts; second, the Auditor shall prescribe a system of reports to be rendered to him at stated periods by the Pacific Railroads, and shall examine the books and accounts of each road at least once a year, and at such other times as may be deemed necessary to determine the correctness of their statements; he shall also assist the Government Directors in all matters coming under their cognizance, and shall make a report to the Secretary of the Interior on Nov. 1, for the preceding fiscal year ending June 30; third, the companies shall make all reports required of them by the Auditor, and shall at all times submit their books for inspection by him, or any person designated by him, in the place where the books are usually kept, and transcripts may be taken if desired; fourth, for each neglect or refusal to submit the books for inspection, a forfeiture of \$5,000 is imposed, and if such neglect shall be persisted in for six months, the company so neglecting shall forfeit its charter, and in that case it is made the duty of the Secretary of the Interior to inform the Attorney General of the fact, to the end that such forfeiture may be judicially determined.

**Pensacola & Louisville.**—The purchaser of this road at the recent foreclosure sale was the Pensacola Railroad Company, a corporation which was organized fully, May 4, two days prior to the sale, under a charter granted by the Florida Legislature in 1877. The new corporation issues \$300,000 stock and \$350,000 bonds upon its 44 miles of road; the amount of the old bonds was \$600,000. The sale does not change the management, as for nearly two years past the road has been operated provisionally as the Pensacola Railroad, under the control of the same parties who now acquire full title through the foreclosure.

**Portland & Ogdensburg, Vermont Division.**—The St. Albans (Vt.) Messenger says: "The commissioners appointed by the court to take testimony and report their decision to the Supreme Court to be held next August, in the matter of charges for freight between Swanton and Rouse's Point, and vice versa, sent to the Central Vermont Railroad at Swanton by the Portland & Ogdensburg Railroad for Western points, and from the Ogdensburg & Lake Champlain road for the Portland & Ogdensburg Railroad, have filed their report at Montpelier. They decide that the rate

to be charged by the Central Vermont shall be 90 cents per ton, subject to the classification of the Central Vermont freight tariffs. Passengers will be taken at regular rates between Swanton and Rouse's Point."

**Pittsburgh, Cincinnati & St. Louis.**—This company makes the following statement for the three months ending March 31:

Gross earnings	\$793,637
Expenses (57.49 per cent.)	456,452
Net earnings	\$337,185
Interest on bonds, three months	167,447
Surplus	\$169,738

The gross earnings include interest received on equipment; the expenses include interest on car trusts and rent of Monongahela Extension.

**Pittsburgh, New Castle & Lake Erie.**—This company, which is building a narrow-gauge road from Pittsburgh to Youngstown, O., has agreed upon terms of consolidation with the Chicago & Atlantic Company, which purposes building a road from Youngstown to Chicago.

**Saginaw Valley & St. Louis.**—The Saginaw (Mich.) Republican says: "For some time back the Saginaw Valley & St. Louis Railroad have been endeavoring to make a contract with the Michigan Central Railroad Company for the use of their road into this city from the Tittabawassee River. It was the intention of the St. Louis Company, if they could not obtain a fair, equitable and just contract, to build a road of their own, and steps were taken by them to this end. Finally a proposition was made that was most favorable to all parties concerned, and a perpetual contract made, and the compensation paid. The St. Louis Company now has the use of all the docks, depots, switches, yards and track of the Jackson, Lansing & Saginaw road from the Tittabawassee River to the Flint & Pere Marquette junction."

**Seaboard Pipe Line.**—The Baltimore Gazette of May 13 says: "B. D. Benson, James M. Hooper, of Titusville, Pa., and C. B. Benson, of Oswego, N. Y., had a conference on Saturday, at the Carrollton Hotel, with Mr. F. P. Stevens and others, of Baltimore, in reference to matters connected with the Seaboard Pipe Line, negotiations for the building of which have been going on for some months. Mr. Benson is the President of the Seaboard Company, and has great hopes of the ultimate success of the enterprise. A right of way has been purchased of all of the land owners from Curtis Creek, near Baltimore, to the Pennsylvania State Line, and in Pennsylvania to the oil regions in Butler County, Pa. The failure of the free-pipe bill in the Pennsylvania Legislature, Mr. Benson says, will in no way interfere with the building of this line, as the company has a fee-simple title to the right of way connecting their pipes on both sides of the state line on their own property, and that they cannot be prevented by any existing law from building their line. The right of way in Maryland has been secured by General Herman Haupt, with the assistance of Mr. F. P. Stevens, counsel for the company. In a few days there will be another conference of the managers of the Seaboard Company, when the time for beginning operations will be made known."

**Sioux City & St. Paul.**—The President of this company has issued a circular to bondholders, dated April 15, in which he said: "On the first of May next a coupon will be due on the first-mortgage bonds of the Sioux City & St. Paul Railroad, on which, by the terms of the arrangement made for depositing the unpaid coupons, it was expected that at least part would be paid. The company will not have means to pay any part of it, and in view of some plan being adopted at an early day for the entire re-adjustment of the indebtedness and stock of the company, I have to request that the coupons be retained and not be presented for payment or deposit. The company is now practically free from floating debt and of all indebtedness, except its regular bonded debt and an indebtedness incurred to build elevators and to procure additional equipment. When the equipment bonds and the elevator stocks are redeemed, the whole net earnings of the road can be applied to the interest of first-mortgage bonds. A meeting of the directors has been delayed, \* \* \* but will take place at as early a day as practicable, and it is believed that by delaying it until the month of June a better judgment can be had of prospective business and earnings, and a plan for future operations be adopted on a more certain basis."

**Toledo, Peoria & Warsaw.**—Receiver Hopkins reports for March and April as follows:

Balance, March 1	\$104,243.06
Receipts for March	152,979.90
Receipts for April	142,883.70
Total	\$400,106.66
Disbursements in March	\$198,092.37
Disbursements in April	133,500.14
	331,592.51
Balance May 1	\$68,544.15

In March the disbursements were greater than the receipts by \$45,082.47; in April the receipts were greatest by \$9,383.50, making the disbursements \$35,698.91 greater than the receipts for the two months.

**Utica, Ithaca & Elmira.**—The purchasers of this road at the recent foreclosure sale have organized a new company known as the Utica, Ithaca & Elmira Railway Company, and have filed the articles of incorporation with the Secretary of State of New York. The capital stock of the new company is \$2,000,000; the largest stockholder is Mr. G. J. Rice, who represents the English holders of the old bonds, and who is also President of the new company.

**Wabash.**—Another suit has been begun in the New York Supreme Court by Samuel Barton, a bondholder. The allegations in the complaint are substantially the same as those in the Tyson suit in Illinois, that the company is practically insolvent, and that the road is unable to earn the interest charges upon it as made by the reorganization. The Court granted a temporary injunction restraining the company from paying interest on any but the first-mortgage bonds, and ordered the company to show cause why the injunction should not be made permanent.

The Tyson suit was not argued in the Illinois Circuit Court May 11, as expected, but was on that day brought before the United States Circuit Court at Springfield, Ill., to which it had been removed, on a motion to remand to the State Court. After a short hearing the case was set for argument on June 3, the injunctions heretofore granted to restrain payment of coupons by the Company being continued until that time.

**Warren & Bradford.**—This company has about completed the surveys for its proposed line from Warren, Pa., east by north to Bradford, about 80 miles, and is now making arrangements to begin work. A proposed agreement, by which this company and the Olean, Bradford & Warren were each to build one half of the road, has fallen through, the companies being unable to agree as to the terms. The company has secured permission to use the Philadelphia & Erie depot at Warren and to run a short distance on the

tracks of that road, using a third rail, as the road is to be 3 ft. gauge.

**Whitewater Valley.**—The recent sale of this road to Wm. H. Rollins, Charles W. Short and others for the bondholders has been confirmed by the Court.

It is announced that the road will hereafter be worked in connection with the Fort Wayne, Muncie & Cincinnati and under the management of the same officers.

**Wilmington & Weldon.**—The Wilmington, Columbia & Augusta Company, being unable to pay the rental overdue, surrendered its lease of this road April 15, and it has since been operated by the company. There has, however, been no change in management, the old officers continuing in charge. President Bridgers reports that the earnings for the six months ending March 31 were:

Gross earnings (\$1.718 per mile)	\$307,563.72
Expenses (53.68 per cent.)	165,105.72
Net earnings (\$794 per mile)	\$142,458.00

There has been a decrease, chiefly in local business. The company is in good condition financially, the floating debt being only \$36,714 and the net earnings sufficient to meet all payments. The property was much improved during the lease and the equipment increased. The betterment bonds issued to the lessee have been surrendered and cancelled. The President says there are still 29 miles of old rails, some in use 25 years, and says that the stockholders must decide whether these shall be replaced at once and dividends be passed for a time, or shall dividends be paid and the renewals spread over several years. He recommends the former course, as most economical, especially as the road must be in good condition to secure through business.

The investigating committee appointed at the last annual meeting, reports that the road and equipment are in satisfactory condition.

## ANNUAL REPORTS.

### Greenville & Columbia.

This company owns a line from Columbia, S. C., northwest to Greenville, 143.5 miles; the Abbeville Branch, 11.5 miles; the Anderson Branch, 10 miles, and the old Laurens Railroad, which has been rebuilt from Helena to Clinton, 21 miles. It also works the Blue Ridge road, from Anderson to Walhalla, 33 miles, making 219 miles worked and 186 owned. Arrangements have been made for the purchase of the Blue Ridge road. The following statements are from the reports presented at the recent annual meeting, for the year ending Dec. 31, 1877.

The earnings for the year were as follows:

	1877.	1878.	Inc. or Dec.	P. c.
Gross earnings	\$381,910.24	\$422,357.12	D.	\$40,446.88
Expenses	301,265.36	246,279.11	I.	44,986.25
Net earnings	\$180,644.88	\$176,078.01	I.	\$4,566.87
Gross earnings per mile	1,743.88	1,928.57	D.	184.69
Net earnings per mile	824.73	804.01	I.	20.72
Per cent. of exps.	52.71	58.31	D.	5.60

The reduction in business was made up of a decrease of \$2,456.47 in passenger receipts, \$55,088.08 in freights and \$2,812.33 in other earnings. There were 15,797 bales of cotton carried less than in 1876.

The bonded debt of the company is not too large to be carried easily, but there is a floating debt of \$555,000, part of which is indorsed by the South Carolina Company. To meet this will give the company some trouble, and the President thinks that an effort should be made to get some help from the bondholders, and that they should be asked to co-operate in some plan for adjusting the debt. The plan can only be agreed upon after consultation with all parties in interest.

The necessities of the company have delayed the completion of the Laurens Branch, but some work has been done upon it. Arrangements are nearly completed for securing a full title to the Blue Ridge road, the purchase being made almost entirely with bonds of the company, of which \$129,500 have been used for this purpose.

Superintendent Dodamead asks for a new passenger engine and for 1,000 tons of rails for the current year's renewals.

### Mobile & Montgomery.

This company owns a line from Mobile, Ala., northeast to Montgomery, 179 miles. The present company acquired possession of the road through a foreclosure sale in 1874; its latest report is for the year ending Dec. 31, 1877.

The bonded debt consists of \$261,000 old mortgage bonds, subject to which the road was sold; the bonds issued under the foreclosed mortgage were converted into stock of the new company. The net receipts for the first two years were used in putting the road in good order and supplying sufficient equipment for its business.

The earnings for the year were as follows:

	1877.	1878.	Inc. or Dec.	P. c.
Freight	\$402,552.41	\$410,387.83	D.	\$7,835.42
Passengers	212,843.43	228,111.09	D.	15,267.66
Mail, express, etc.	50,641.25	51,683.70	D.	1,042.45
Total	\$666,037.09	\$690,192.72	D.	\$24,155.63
Expenses	441,476.20	442,207.79	D.	731.59
Net earnings	\$224,560.89	\$247,984.93	D.	\$23,424.04
Gross earn. per mile	3,720.99	3,855.83	D.	134.84
Net earn. per mile	1,254.53	1,385.39	D.	130.86
Per cent. of exps.	66.28	64.07	I.	2.21

The tonnage mileage for the year was as follows:

	1877.	1878.	Inc. or Dec.	P. c.
Moved north	7,924,015	8,515,042	D.	591,027
Moved south	13,069,381	12,958,078	I.	141,303
Total	21,023,396	21,473,120	D.	449,724

The decrease in traffic was less than that in freight earnings, indicating a decrease in rates. The freight traffic in 1877 was equal to 160.9 tons carried each way daily over the whole length of the road.

The construction account was finally closed Dec. 31, 1876, leaving a balance of construction indebtedness amounting to \$69,800. The income account for 1877 was as follows:

Net earnings	\$224,561
Less balance of construction indebtedness	69,800
Balance	\$154,761
Coupons and interest	\$20,318
Taxes	24,425
Expenses bondholders' committee	16,118
Materials purchased but not used	1,144
	62,005

Balance, Jan. 1, 1878.....\$92,756

Since the close of the year a dividend of 3½ per cent. has been paid. In the report the President says: "In closing this brief report, I beg leave to state my opinion that the future of the Mobile & Montgomery Railway Company is perfectly assured, that the property is worth at least \$3,500,000, and that after the 1st of January, 1880, it will pay 3½ per cent. semi-annually on this amount."